.....Index to CONTENTS, May, 1931.....

The Semi-Annual Index will be found at the end of the June and December issues

Airports
Asphalt for Airport Surfaces..... 103
Ceiling Projector Shows Cloud Heights... 181

Beautification, City
Elevation Aids the Grass Plots..... 144

Bell Towers
Community Bells and Singing Towers.... 110

Billboards
More Billboard Control..... 144

Buildings
Highest Standards of Architecture Urged. 123

Citizen Interest
Wisconsin Develops a Citizens' Approach to Its Problems..... 104

City and County Planning and Zoning
Rochester Adopts Official Map..... 5
Beauty and Safety in a City's Streets..... 95
County Planning Proves Its Value..... 116
Novel Alignment for Regional Planning... 132
City Planning Wins Remarkable Victory.. 144
Cleveland's Civic Center Extension Plan.. 147
Zoning and Planning Notes..... 163

Civic Education
Montreal Photographic Show Aids Civics.. 145

Conventions
When and Where..... 171

Engineering
Who's Who, City and County Engineers.. 15

Finance
The Taxpayer's Dollar..... 149
The Municipal Bond Market..... 165

Fire Prevention and Control
Safe and Speedy Arrival at Fires..... 23
A Model Fuel Oil Burner Ordinance..... 23
Fire Waste Contest Winners..... 25
Lessons Learned at Fire Schools..... 107
How Lakewood Won the Grand Prize in the Inter-Chamber Fire Waste Contest.. 122
A Motor Fire-Truck Where No Roads Exist 138
Firemen's Salaries, New York State..... 145

Forestry
Planting Trees for Civic Beauty..... 94

Forward Steps
Items Contributed by Officials, etc..... 141

Government and Administration
Dallas Elects Council under Manager Plan. 5
Recent City Manager Appointments..... 5

Health
Winning and Honor Cities, 1930 Health Conservation Contest 146

Housing
Proper Directions for Public Effort..... 118
Satisfaction and Dividends..... 125
Municipal Land for Housing in Spain.... 146
Housing Betterment in Massachusetts..... 146

Legal Decisions
The City's Legal Rights and Duties..... 159

Mayors
American Mayors to Tour France..... 5

Motor Equipment
Service Department, Kenosha, Wis..... 11
Dump Hoist for Light-Duty Trucks..... 183

News and Illustrations
Hints for Officials..... 183

Outdoor Lighting
Armored, Moisture-proof Underground Cable 191
Tunnel and Viaduct Lighting Fixture.... 193
Rates and Physical Data, Street Lighting, New York State..... 194
High-Intensity Floodlight..... 196

Parks
Jones Beach State Park..... 126

Police
Police Improvement Program, Chicago.... 133
Policemen's Salaries, New York State.... 145

Population
Higher Census Count Denied to Atlanta... 96

Power Plants
Power Plant, Cambridge Water Works.... 105
World's Largest Diesel Engine, Denmark.. 146

Publications
Municipal and Civic Publications..... 167

Recreation
A "Learn to Swim" Campaign..... 17
Winter Sports 17
A Handicap Horseshoe Tournament..... 17
Building with Imagination..... 17
For More and Better Municipal Baseball.. 99
An Indoor Rifle Range..... 144
A Safe Playground Device..... 187

Reports, Municipal
Telling Citizens How the Public Job Is Done 113

MAY 1931 — VOL. XLIV No. 5

The American City

ISSUED MONTHLY BY THE
American City Magazine Corporation
470 Fourth Ave., New York

EDGAR J. BUTTENHEIM, Pres. and Mgr.
HAROLD S. BUTTENHEIM, Editor
THEODORE R. KENDALL
Secretary and Engineering Editor
H. M. OLMSTED — M. V. FULLER
MARTHA CANDLER
Associate Editors
HERBERT K. SAXE
Treasurer
PRENTICE C. FORD, Asst. to President — MYRON MacLEOD, Advertising Manager

BRANCH OFFICES
Daily News Plaza, Chicago
TOM DIX, Vice-President
642 Hanna Building, Cleveland
GEORGE S. CONOVER, Manager

Subscription, $4 per annum
(To any part of the world)
Single copies, 50c
Back numbers available

Entered as second-class matter, July 29, 1910, at the Post Office at New York, N. Y., under Act of March 3, 1879. Printed in U. S. A.

In THE MUNICIPAL INDEX (an 875-page annual volume) readers will find much material, including articles, lists and bibliographies on a wide variety of municipal and civic subjects, not published in the monthly issues of THE AMERICAN CITY. THE MUNICIPAL INDEX is furnished to city and town purchasing officials without charge

Sewers and Sewage Disposal
$13,000,000 System for Atlanta..... 11
Sewer Maintenance, Fargo, N. Dak..... 11
Activated Sludge Treatment and Mechanical Sand Filters, Barrington..... 11
Modernizing a Sewage Treatment Plant... 91
How Dunkirk Cleaned Up Its Front Yard. 130
Improved Joint for Concrete Sewer Pipe.. 187

Statistics
Data for 31 Massachusetts Municipalities. 124

Street Cleaning and Snow Removal
Street Cleaning and Garbage Collection under One Foreman..... 19
Few Problems in Raleigh..... 21
Many Uses for Street Flusher..... 21
Emergency Slush Removal, Indianapolis.. 21
Street-Cleaning Trucks, Philadelphia..... 21
Street Cleaning and Dust Laying, Spokane. 97

Street Signs
Uniform Signs with Reflecting Letters.... 23
New Signs, Wooster, Ohio..... 142

Streets
Cotton Fabric in Road Making..... 13
More One-Lane Pavements Needed..... 13
Seawall, Lake Ponchartrain Development.. 13
Bituminous-Surfaced Concrete Sidewalks.. 108
Low-Cost Bituminous Treatment—II..... 135
Oil-Burning Weed Burners..... 173
Improved Elevating Grader..... 173
A New Paving Material..... 175
Spreader for Gravel and Calcium Chloride. 177
All-Steel Sidewalk Crossing, Railroads.... 177
Truck-mounted Heater and Distributor.... 179
Iron Cribbing for Retaining Walls..... 181
Non-Skid Floor Plates..... 183
Waterproof Building Paper for Curing Concrete 187
High-Speed Bituminous Distributor..... 189
Dump-Body Attachment, Power Graders... 191

Traffic and Transportation
Uniform Motor Regulations Urged, Europe 23
Low Street-Car Fares for Washington Children 98
Street-Car Safety Zones, Detroit..... 141
Traffic Control and Facilitation..... 153
Certain Traffic Fatalities Decrease..... 157
Painting Traffic Lines with Gasoline..... 175

Unemployment
165,000,000 Days' Work in Program..... 132
Community Relief, Fort Wayne, Ind..... 143
In Little Rock, Ark..... 143
Rebuilding of Cities, Unemployment Aid.. 146

Waste Collection and Disposal
Controlled Dumping in an English City.. 19
Cleaning Central Markets of Paris..... 19
Incineration, Hinsdale, Ill..... 101
Sanitary Collection of Refuse..... 183

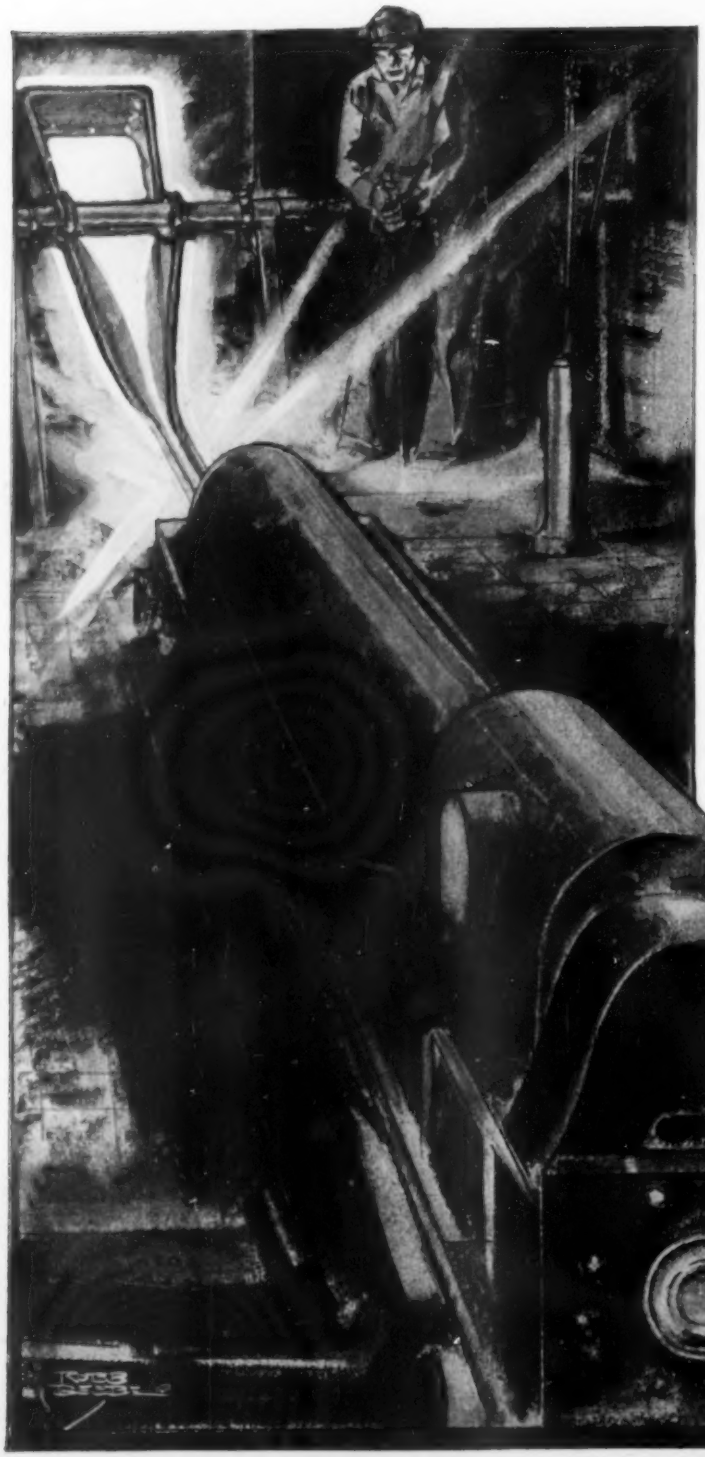
Water Supply and Water Works
Private vs. Municipal Ownership..... 7
Water-Softening Plant, Small Community. 7
Water Supply, Boulder City..... 7
Officials and Directors, A. W. W. A..... 9
Water Supply, Pittsburgh, Pa..... 89
Valves Inserted in Water Main..... 102
New Pumping Unit, Cambridge, Mass..... 105
Raising Valve Boxes to Grade..... 106
Linings for Water and Sewer Pipe..... 119
Water Rates and Regulations—I..... 139
Meters of the Disc Type..... 175
Chlorine by Airplane..... 175
Contest for Water-Tank Design..... 175
Modern Municipal Business Organization. 179
Remote Water-Level Indicators and Meters 187
Water-Analysis Equipment..... 189
Fire Hydrant with Unusual Features..... 191
Low-Cost, Accurate Main-Line Meters..... 193

Who's Who
Portraits of Officials.....9, 15, 25

See pages 27, 29, 167, 169 for notices of catalogs and publications on many municipal and civic subjects

For Index to Advertisements see page preceding back cover.

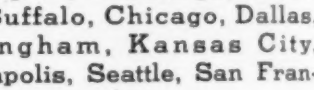
U. S. de Lavaud Pipe



The development of deLavaud Pipe is regarded as the greatest single advance in the cast iron pipe industry. Tests have shown that deLavaud Pipe is at least 25% stronger than good pit cast pipe. Also, this pipe is lighter in weight—more economical to handle. And, it offers greater carrying capacity for the same outside diameter.

The deLavaud Handbook gives complete details and specifications. For free copy address United States Pipe and Foundry Co., Burlington, N. J.

Sales offices located in the following cities: New York, Philadelphia, Pittsburgh, Cleveland, Buffalo, Chicago, Dallas, Birmingham, Kansas City, Minneapolis, Seattle, San Francisco, Los Angeles.



Our pipe bears the "Q-check" trademark of The Cast Iron Pipe Research Association

Automatically controlled pouring assures a uniform flow of iron.

Trip Abroad—Changes at Home

More Than a Score of American Mayors to Tour France

As guests of France, more than twenty American mayors, accompanied in most cases by their wives, are to sail from New York on the Ile de France on May 15 for the opening of the International Colonial and Overseas Possessions Exposition in Paris and for a subsequent tour of France.

Invitations for this trip were extended on behalf of the Municipal Council of Paris, the Ministry of Public Works and the Exposition Committee, to the mayors of the 37 American cities who were hosts of the French Transatlantic Fliers, Dieudonne Costes and Maurice Bellonte, on the Aviators' Good Will Tour of the United States. Arrangements are being made by René Racover, who supervised the Frenchmen's flight from Paris to New York and their American tour last September.

Acceptances for the tour (to April 28) have been received from: Mayor and Mrs. John C. Porter, of Los Angeles; Mayor and Mrs. John D. Marshall and daughter, of Cleveland; Mayor and Mrs. Victor J. Miller, of St. Louis; Mayor and Mrs. William F. Broening, of Baltimore; Mayor and Mrs. Daniel W. Hoan, of Milwaukee; Mayor and Mrs. T. Semmes Walmsley and daughter, of New Orleans; Mayor James L. Key and daughter of Atlanta; Mayor and Mrs. Benjamin F. Stapleton, Denver; Mayor and Mrs. J. Waddy Tate and secretary, of Dallas; Mayor and Mrs. Richard L. Metcalfe, of Omaha; Mayor and Mrs. R. B. Marvin, of Syracuse; the new Mayor, C. J. Blinn, and the former Mayor, Walter C. Dean, of Oklahoma City; Mayor J. F. Bright, of Richmond; Mayor and Mrs. Walter E. Batterson, of Hartford; Mayor Frederick W. Donnelly, of Trenton; Mayor and Mrs. R. E. Thomas, El Paso, Texas; Mayor and Mrs. George W. Coan, Jr., of Winston-Salem; Mayor and Mrs. Franklin D. Lane, of Phoenix; Mayor and Mrs. James P. Pope, of Boise City; and Mayor and Mrs. Gray, of Pasco, Wash. Sylvester Andriano, a member of the Board of Supervisors of San Francisco and Mrs. Andriano, will represent Mayor Angelo J. Rossi of that city; and E. Kirk McKinney, President of the Board of Public Works, will represent the Mayor of Indianapolis.

At the time of our going to press the following officials had locally announced their intention of going, but official acceptance had not been received:

Mayor James M. Curley, of Boston (and daughter); Mayor William F. Kunze, of Minneapolis; Mayor G. L. Baker, of Portland, Ore.; Mayor Gearhard Bundlie, of St. Paul; Mayor John F. Bowman, of Salt Lake City; and Mayor J. H. Bayliss, of Pensacola, Fla.

The return trip of the party will be made on the Ile de France, arriving in New York on June 23. The headquarters of Mr. Racover in Paris during the tour will be at the George V Hotel.

Rochester Adopts Official Map

(By telegraph to The American City)

CITY Council of Rochester on April 27 adopted an official map including an entire major street or thoroughfare plan for the city, under New York State law. This action fixes the lines of proposed new street openings and extensions, totaling approximately 13 miles, and establishes setback building lines upon 106 miles of streets designated for future widening, of 145 miles of streets included in the entire thoroughfare system. Twenty-six miles are now of adequate width. The development of a long-term improvements program including the most pressing of proposed street extensions as well as other projects included in the city plan is contemplated. The Monroe County Regional Planning Board is preparing a highway plan for the county, taking up where city plan stops.

CAREY H. BROWN,
Executive Director, Rochester Civic Improvement Association, Inc.

Dallas Elects Council Under Manager Plan

THE new council-manager charter of Dallas, Texas, the adoption of which was noted in The American City for November, 1931, and which goes into effect May 1, received an encouraging impetus on April 7 with the overwhelming victory of the Citizens' Charter Association ticket for the council. The five councilmen elected, with their business affiliations, are as follows: T. L. Bradford, Chairman of the Board of the Southwestern Life Insurance Co.; J. C. Thompson, Secretary-Treasurer of the Southland Ice Co.; Charles E. Turner, real estate, member of City Plan Commission; E. R. Brown, President, Magnolia Petroleum Co.; H. C. Burroughs, owner of drug stores; T. M. Cullum, Cullum & Boren, sporting goods; Victor H. Hexter, Vice-President of Union Title & Guarantee Co. and Chairman of Zoning Board of Appeals; Arthur B. Moore, President, Cox-Moore Drug Co.; and W. H. Painter, Secretary-Treasurer, United Fidelity Life Insurance Co. The first three above were elected at large, the other six being elected from districts. There were opposition candidates for five of the places.

At a caucus on April 8 the council-elect chose T. L. Bradford to take the office of mayor on May 1. The mayor has the same vote and compensation as the other council members, and has no veto power. The council appoints the city manager, city attorney, supervisor of utilities, judge of the corporation court, city secretary and civic service board, and confirms the nomination of the city auditor, made by the presidents of clearing-house banks.

As noted below, John N. Edy has been selected as city manager.

Items for Mayors and City Managers

Recent City Manager Appointments

John N. Edy, City Manager of Flint, Mich., since June, 1930, recently resigned his position and has been appointed the first City Manager of Dallas, Texas, effective May 1. From 1923 until his appointment in Flint, Mr. Edy was City Manager of Berkeley, Calif.

George Austin was appointed Town Manager of Windsor, Vt., on March 27. Alfred L. Farmer, City Manager since April, 1926, remains as Manager of the village of Windsor.

Ivan G. Bridges has been appointed City Manager of Clovis, N. Mex., succeeding R. V. Miller.

F. W. Cooke has been appointed City Manager of Mt. Lebanon, Pa. He succeeds G. J. Irwin.

L. P. Cookingham, City Manager of Clawson, Mich., since January, 1927, became City Manager of Plymouth, Mich., in April. He succeeds A. J. Koenig.

H. W. Wedge, City Engineer of Clawson, Mich., became City Manager of Clawson, April 1.

Samuel B. Furbish was appointed first City Manager of Dexter, Maine, in April. He is a graduate of Amherst College and was Treasurer of Bowdoin College for some time.

J. W. Jones was appointed City Manager of Auburndale, Fla., in January, succeeding D. P. Nunn.

J. M. Price became City Manager of Quitman, Ga., last January. His predecessor was Paul A. Tanner.

Arthur Richards resigned as Assistant Engineer of the New Jersey State Water Policy Commission to become the first City Manager of Mamaroneck, N. Y., on April 7. He attended Ohio State University, was employed for six years on the construction of the Panama Canal, and has been engineer or consultant of several different cities.

George R. Wade has been promoted from the position of Acting City Manager to that of City Manager of Tucson, Ariz., in January. He succeeds C. E. Pequignot, who resigned his position because of ill health.

CLARENCE E. RIDLEY,
Executive Secretary, The International City Managers' Association.

High lights in waterworks engineering progress . . .

1,250,000 gallon Horton Radial-cone bottom tank, Brooklyn, N. Y. 75 ft. 6 in. to bottom

Horton 1,000,000 gallon ellipsoidal bottom tank at High Point, N. C. 117 ft. 4 in. to bottom

SINCE the days of the old-fashioned tall standpipe, great strides have been made in providing better water service at less cost.

One characteristic of modern engineering is the trend toward large elevated storage. The experience of many municipalities has shown that ample elevated storage may be the most economical solution to the water problem. This may mean a large centrally located tank or several tanks serving local districts.

Another high light in engineering progress is improved tank design. Shallow depth tanks, as exemplified by Horton ellipsoidal-bottom type, have cut operating costs by minimizing the differences in tank pressures that the pumps work against. The latest development of this principle is the Horton radial-cone bottom design for large capacities.

The combination of large elevated storage and Horton shallow-depth design has benefitted municipalities in such ways as: improved water service at low annual cost, postponement of increased pumping capacity and main enlargements with consequent torn-up streets, ability to handle abnormal consumption such as fires or trunk-line breakdowns....etc.

Municipal officials and water works engineers are invited to write our nearest office for further data and quotations on Horton tanks.

CHICAGO BRIDGE & IRON WORKS

Chicago	2127 Old Colony Bldg.
New York	3108 Hudson Terminal Bldg.
Cleveland	2236 Midland Bank Bldg.
Detroit	1501 Lafayette Bldg.
Philadelphia	2616-1616 Walnut Street Bldg.
Boston	1501 Consolidated Gas Bldg.
Birmingham	1502 Fiftieth St., N.
Dallas	3606 Magnolia Bldg.
San Francisco	1033 Rialto Bldg.
Seattle	4343 Smith Tower
Los Angeles	1303 Subway Terminal Bldg.
Houston	1101 Electric Bldg.
Tulsa	2425 Exchange Bank Bldg.
Havana, Cuba	Apartado 2507

HORTON TANKS

AC-5-Gray

Pure Water—Man's Greatest Need

Items on Water Supply and Purification

Private vs. Municipal Ownership of Water Works

IN two very interesting paragraphs, discussing a paper presented before the American Society of Civil Engineers, on the water works of St. Louis, Harrison P. Eddy, Metcalf & Eddy, consulting engineers, Boston, Mass., makes an effective comparison of conditions in private and municipal ownership of water works. He states:

"There are, in all probability, proportionately as many municipal water departments which are inefficiently or even dishonestly operated, as there are privately owned plants which are either inefficient or charging excessive rates. Municipal water works, as a rule, pay ridiculously inadequate salaries to the men in responsible charge; and when adequate salaries are provided, the positions in many cases are so tempting to politicians, that competent technical men have little chance.

"Also, there have been many cases where it has required years to educate the electorate to the point of voting the necessary funds for urgently needed work of water supply or purification, whereas prompt action probably could have been obtained from the directors of a progressive water company. In principle, the public should own its water works; in practice, there are cases where better results can be obtained under private ownership."

Water-Softening Plant for a Small Community

THE water-supply for the village of New Richmond was obtained from the Ohio River without treatment until the construction of a water-softening plant which was put in operation in 1927. The supply is now drawn from two wells, which give a water of high iron content. This characteristic of the well water was the determining factor in the decision to construct a lime-soda softening plant in place of a zeolite plant.

The essential features of the plant are the solution feed chemical equipment, reaction chamber and settling tank, the recarbonation devices and two pressure filters.

The wells are equipped with 300 g.p.m. deep-well pumps. These determine the rate at which the plant is operated, their combined capacity being 600 g.p.m. or 0.9 m.g.d.

The settling tank is of steel 30 feet high and 34.5 feet in diameter, with a capacity of 207,000 gallons. The mixing box is supported at the top of the central well. It is 18 inches wide, 10 feet long and 24 inches deep. The box is shaped on the arc of a circle with an outside diameter of 10 feet. The box is baffled, and it discharges into the central well, which is 10 feet in diameter and extends to the bottom of the tank where the water passes out into the tank proper. The outlet is a 24-inch vertical pipe extending the full depth of the tank. A grid system on the bottom permits sludge to be drawn off while the plant is in operation.

Carbon dioxide can be applied to the water at the bottom of the 24-inch vertical tank effluent line. The detention period in this pipe will provide a contact period of about one minute between the gas and the water.

Two pressure filters, 16 feet by 7 feet, operate at a rate of 172 m.g.d. when the plant is being run at capacity. The filter effluent line connects directly to the suction of the high-service centrifugal pumps.

The well water is much harder than the river water and is therefore more costly to soften, but on account of the fluctuating quality of the river water and the fact that the plant is too small to warrant having full-time technical supervision, the use of a well water of good sanitary quality and uniform chemical quality was favored.

—Abstract from a paper read before the Ohio Conference on Water Purification.

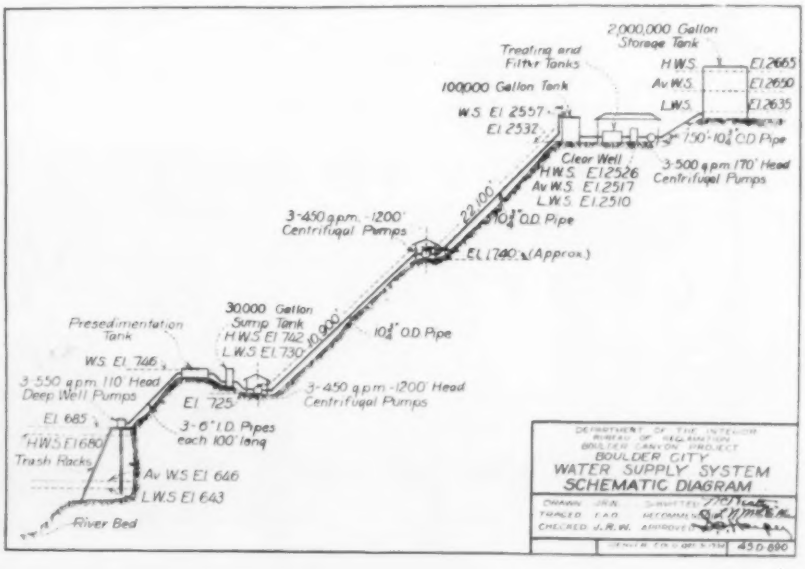
The Water Supply of Boulder City

BOULDER CITY, the new town which will be the main camp used during the construction of the Hoover Dam on the Colorado River, has been laid out according to the most modern city planning system.

One of the first requirements for this new city was a suitable water supply. The water is being taken from the Colorado River 1,800 feet below and 6 miles from the town site. The original installation planned for the use of three 30-horsepower deep-well turbines mounted on a pier structure which would lift the water 110 feet to a pre-sedimentation tank. For these, however, there were substituted three horizontal pumps at the recommendation of Reclamation Service engineers, who were afraid that the sump for the turbines would become silted up, since at the intake the Colorado River carried 5 per cent sediment.

The average water surface is elevation 646 feet, and the pre-sedimentation tank is located at elevation 746 feet, less than 100 feet from the river. From this tank, the water flows by gravity to the first set of booster pumps, each of which is designed for 450 gallons per minute at a 1,200-foot head. There is a static lift of 1,050 feet to the intermediate station, located at elevation 1,755 feet. The water is delivered through 10,900 feet of 10- and 12-inch pipe.

At Station No. 2, there is a duplicate installation which carries the water to elevation 2,557 feet, through 22,100 feet of 10- and 12-inch pipe. The treating and filter tanks are located at this elevation, and the domestic water pumps themselves, each designed for 500 gallons per minute at 170 feet, take the water, after being filtered, and deliver it through 750 feet of 10- and 12-inch pipe to elevation 2,665 feet, where is located a 2,000,000-gallon storage tank to be used as the reservoir for the city. The Byron Jackson Co., of Berkeley, Calif., was awarded the contract for six 4-inch, 4-stage horizontal O. L. Multiplex pumps direct-connected to six 2,300-volt horizontal motors, delivering 200 horsepower at 3,540 r.p.m.



4,000,000-GALLON
FILTRATION PLANT
Menasha, Wis.

If you live near any of these cities—take a trip and see how NORWOOD is providing absolutely safe drinking water for these municipalities—and see how efficiently and economically the filtration plants in these cities run:—

Niagara Falls and Dunkirk, N. Y.; Erie, Pa.; Toledo, Ohio; Evanston, Ill.; Menasha, Wis.; Meriden, Conn.; Three Rivers, Farnham, Drummondville and Victoriaville, Que.; and Hawkesbury, Ont.

We are prepared to build and equip municipal filter plants of any capacity, either pressure of gravity type. We specialize in water-works problems. Let us send you our catalog.

Two Installations of

NORWOOD FILTERS

NORWOOD THREE-UNIT SYSTEM FOR SWIMMING POOLS

Many swimming pools throughout the country are today being kept wholesome, clean, invigorating and safe at small cost with the NORWOOD three-unit filtration system. The advantages of this system are enumerated in our booklet, "Filters for Natatoriums."

Take advantage of NORWOOD cooperation. Whatever your city's needs — whether purer, safer drinking water or purer, safer water for swimming—NORWOOD engineers are always ready to bring you helpful information.

NORWOOD ENGINEERING COMPANY

FLORENCE MASS.

Canadian Offices:
1584 Clark St., Montreal, P. Q.

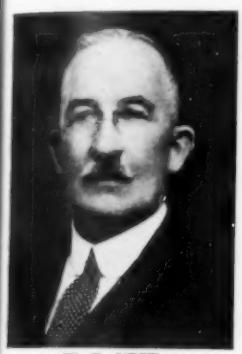
Some of the Officers and Directors of the American Water Works Association

GEORGE H. FENKELL
Gen. Mgr., Dept. of Water Supply, Detroit, Mich.
President

© *Rossi Studio*
WILLIAM W. BRUSH
Chief Engr., Dept. of Water Supply, Gas & Electricity, New York
Treasurer

STEPHEN H. TAYLOR
Supt., Water Works
New Bedford, Mass.
Director

MALCOLM PIRNIE
Consulting Engineer
New York, N. Y.
Director



W. E. VEST
Supt., Water Works
Charlotte, N. C.
Director

J. ARTHUS JENSEN
Engr., Water Works
Minneapolis, Minn.
Director

J. E. GIBSON
Mgr. & Engr., Water Dept.
Charleston, S. C.
Director

C. R. KNOWLES
Supt., Water Service, Illinois Central System, Chicago, Ill.
Director

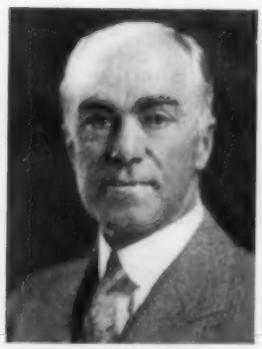
A. F. PORZELIUS
Supt., City Water Co.
Chattanooga, Tenn.
Director

HOWELL WRIGHT
Attorney-at-Law
Cleveland, Ohio
Director

CHARLES D. BROWN
Sec.-Treas., Walkerville-East Windsor Water Commission
Walkerville, Ont.
Director

A. P. MICHAELS
Gen. Mgr., Orlando Utilities Commission, Orlando, Fla.
Director

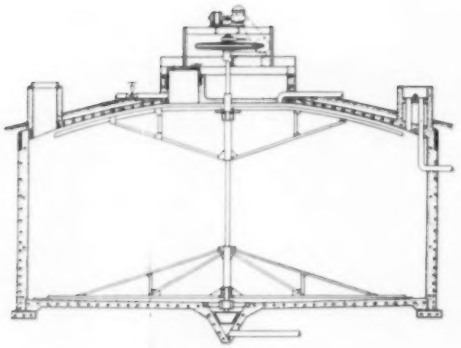
EUGENE CARROLL
Vice-Pres. & Mgr., Butte Water Co., Butte, Mont.
Director

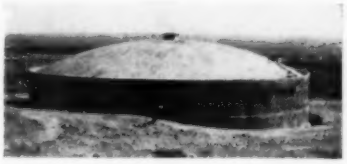


HOWARD S. MORSE
Gen. Mgr., Indianapolis Water Co., Indianapolis, Ind.
Director

THOMAS J. SKINNER
Engr. in Charge of Distribution
St. Louis, Mo.
Director

W. A. KUNIGK
Supt., Water Division
Tacoma, Wash.
Director





Announcing

the Hardinge Digestor

for the Domed Roof Hewett Type Tank

The Hardinge Company has been licensed by Mr. William S. Hewett to use his method of reinforcing tanks and domes for Hardinge Digestors. The dome is self-supporting and further serves to support the digestor mechanism, housing and earth backfill. It is a fully determinate structure and subject to exact analysis when built to this method. The concrete remains in compression at all times.

Rolled thread bars with turnbuckles, placed around the dome abuttment or reaction section after the dome is cast, tightened to a known tension and imbedded with additional concrete or gunite, form a definite fixed dome abuttment.

Hewett domed roof tanks have been built and are in service up to 140-ft. diameter. Three 75-ft. diameter domes with Hardinge mechanisms for Sludge Digestors are now under construction.

This method of construction forms a tight, stable structure, eliminates unsightly bridge superstructures, is architecturally pleasing and **shows a saving in total cost of tank and mechanism.**

HARDINGE COMPANY
YORK, PENNSYLVANIA
WORKS AND MAIN OFFICE YORK, PENNA.
BRANCH OFFICES
NEW YORK, N.Y., 122 EAST 42nd STREET
SALT LAKE CITY UTAH: CONTINENTAL BANK BLDG.
CABLE ADDRESS HARDINGE, NEW YORK

HARDINGE

Conical Ball, Pebble and Rod Mills, Ruggles-Cole Dryers, Feeders, Thickeners, Rotary Tubular Conveyors, Sanitation Equipment

Sewage Treatment Means Clean Streams

$13,000,000 Sewer System for Atlanta

ATLANTA, Ga., has outgrown its sewerage system, which now requires a complete overhauling, rebuilding and extension. It is estimated that this work will take over five years and will cost approximately $13,000,000. This is a problem affecting a very large part of Fulton and DeKalb Counties and small areas in Clayton and Campbell Counties. The days when a municipality could dump its sewage into a nearby stream and forget it have passed. The people downstream have rights which must be respected.

As it is not wholly Atlanta's problem, this city will not bear all the cost, though naturally its large proportion of property will carry most of the tax. It seems assured that it will be necessary to impose a special tax for the work, but this will be made payable over a long term of years.

It is planned to ask the next regular session of the Georgia Legislature to create a sanitary drainage district which will include all the area served by the proposed greater sewerage system, with authority to issue bonds of a sufficient amount and to levy a special tax to pay the interest and sinking-fund and gradually retire the bonds.

The subject is treated exhaustively in a booklet, "Sanitary and Storm Water Sewerage Report for Atlanta and Its Environs," submitted by Whitman, Requardt and Smith, engineers, of Baltimore, and Robert & Co., associate engineers, of Atlanta, who acknowledge the expert assistance given them by Clarke Donaldson, Chief of Construction of Atlanta, and his department.

The new system outlined by the engineers looks toward providing for the district's needs until 1965, or 35 years ahead. Taking Atlanta's past growth as a guide, the city's maximum population in 1965 is estimated at one million, but in planning the sewer system a more conservative estimate of 800,000 has been the basis of the calculations of the engineers.

Numerous difficulties were encountered in planning the system, according to the report. Part of the city drains into the Chattahoochee River and thence into the Gulf of Mexico, and part into the Flint River and thence into the Ocmulgee and other streams and into the Atlantic Ocean. The city and its environs are full of hills and valleys and ravines.

For years the city has treated its sewage before discharging it into the rivers. The principal plant, which is located near Peachtree Road, on Peachtree Creek, was remote from the city when it was built, but the region is now being developed and is becoming a fashionable residence section. The new plan proposes to do away with this plant, which will be replaced by a much larger plant on the Chattahoochee River, well below the intake of the waterworks system.

Rebuilding of the existing system inside the city is not contemplated, except as special conditions arise. However, extensive enlargements and repairs will be necessary and many miles of additional sewers must be built. The plan includes several long tunnels to be bored through solid rock, and several new disposal plants.

When the huge undertaking is finally complete, it is expected that the streams in and near the city will be freed from the objectionable odors that arise at times; that the lower sections of the city will no longer be flooded during excessive storms; and that many square miles of land will be enhanced in value.

Sewer Maintenance in Fargo, N. Dak.

IN the maintenance of trunk sewers 4 feet and over in diameter, in Fargo, N. Dak., they are inspected annually, and written reports of condition, flow, repairs necessary, and previous repairs made, are prepared. Lateral sewers are flushed and cleaned in the spring and fall of the year with a fire hose and various types of nozzles. Obstructions in the small sewers are removed by means of sewer turbine, nozzles, and sewer rods. Very little trouble is experienced due to roots entering the sewers.

Catchbasins are cleaned annually in the fall. During the spring, frozen inlets and tile leads are opened by means of three 10-hp. stationary boilers which are mounted on a chassis and fitted and equipped by local design. These steamers are towed by trucks from place to place and have proved excellent in keeping approximately 1,000 drainage inlets and catch-basins functioning.

W. P. TARBELL,
City Engineer.

Kenosha Maintains Service Department for All Motor Equipment

ALL the city trucks and other motor equipment used in Kenosha, Wis., are housed in the city garage on the northwest corner of 10th Avenue and 55th Street. Three mechanics are employed in the garage to make all repairs on the city's fleet of motor units. The garage is provided with a gasoline storage tank, gas pumps, a stock of lubricating oils and necessary tools and equipment for making repairs.

An accurate account is kept of the labor and material used in the maintenance of each car and truck, as well as the amount of gas, oil, etc., consumed by each unit. During 1930, the oiling and greasing of motor units was standardized by the keeping of card records indicating the mileage and dates of oiling and greasing. The operators are held responsible for the proper care of the units which they operate. The driver is also required to make a report on the mechanical condition of his truck following the close of each day's work. This helps in keeping a check on the service men to be sure that repairs are promptly made.

The operating cost of the Service Department during 1930 was $17,466.43.

P. J. HURTGEN,
Director of Public Works.

Barrington Uses Activated Sludge Treatment and Mechanical Sand Filters

A MODERN filtration plant has been built in conjunction with the new activated sludge plant for the borough of Barrington, N. J. The plant has been designed for a future population of 6,000, with a 100-gallon per capita flow. The effluent from the final settling tanks is filtered through mechanical sand filters at the rate of 1½ gallons per square foot per minute.

The filtration plant consists of four concrete gravity filter units, each 7 feet by 10 feet by 8 feet deep. Each unit is provided with a cast iron manifold, laterals, wash trough, rate controller, loss of head and rate of flow gages. The filtering material consists of 18 inches of gravel ranging in size from 2½-inch to 10-inch mesh, and 27 inches of sand having an effective size of 0.35- to 0.50-millimeter, with a uniformity coefficient of 1.7.

Water for washing the filters is taken from the contact tank, after chlorine has been applied, by means of a 1,000 g.p.m. horizontal centrifugal pump, which provides wash water at the rate of approximately 15 gallons per square foot per minute with a vertical rise of 24 inches per minute.

During the washing process the wash water is discharged into a concrete storage basin underneath the filters, from which it is automatically pumped and discharged through a cast iron force main into the grit chamber, where it passes through the plant again.

This plant was designed by Remington, Vosbury and Goff, consulting engineers, of Camden, N. J. Roberts Filter Manufacturing Co. furnished and installed the mechanical equipment. The total cost of the plant, including the sewer system and low-level pumping station, was approximately $330,000.

F. BENDER.

FOR EVERY CONDITION

HOT
COLD
WET
DRY

The Servicised Sponge Rubber Expansion Joint is the most perfect protection from severe water conditions and extreme heat. A non-oozing super-elastic joint material—impervious to water.

Type "B" Servicised Expansion Joints are of special quality asphalt and selected fibres—very low in moisture absorption—maximum elasticity and plasticity—minimum of oozing—long life and resistant to traffic wear.

Reinforced Servicised Expansion Joints were developed for requirements demanding rigidity and strength in fillers. The core of fiber is heavily saturated with high quality asphalt and reinforced on the sides by sheets of saturated felt—a quality joint for certain conditions.

Servicised Center-Core Expansion Joints of fibrated asphalt take up expansion and contraction and assure waterproofing by close adhesion to the pavement proper. The fiber center core reinforces and furnishes elasticity while the fibrated asphalt sides guarantee adhesion to the pavement slab.

Write us of your conditions and get our recommendations.

SERVICISED PREMOULDED PRODUCTS, INC.

GENERAL DISTRIBUTORS For Products Manufactured by

SERVICISED PRODUCTS CORPORATION

FACTORIES AND SALES OFFICES

Chicago
53 W. Jackson Blvd.

Sandusky, Ohio
1st and Sandusky Sts.

Wilmington, Del.
Church and F. Sts.

Construction and Maintenance

Engineering and Highway Departments

Use of Cotton Fabric in Bituminous and Concrete Roads

TESTS on state roads in South Carolina and Texas, using cotton membrane imbedded in the surfacing materials, are said to show that cotton cloth spread on tar-treated surfacing and subjected to hot asphalt treatment offers a quick and durable method of improving rural roads.

Cotton is being tested in this country on road construction in two distinct ways, first as a cotton membrane in the construction of bituminous surface treatment of earth roads, and, second, as a cleavage fabric in concrete highways. Its use in bituminous surfacing has attracted considerable attention as a result of experiments carried on in South Carolina since 1927 and in Texas since 1929.*

In the experiments conducted in these states, the fabric is used to cover either the entire width of the roadway or only the shoulders. It is laid after the surface has been scarified, graded, compacted, smoothed and coated with light tar, the cloth being applied longitudinally while the tar is still sticky enough to hold it in place. Hot asphaltic oil is then applied to the fabric, after which a coarse sand is used to give a wearing surface. The road is then ready for traffic.

Experimental stretches in South Carolina after a year of use are reported to show very little indication of wear. The State Highway Department has announced similar improvements on 70 miles of highway to be undertaken during the next two years.

Among the advantages claimed for this type of construction are the low initial cost and cost of upkeep, which are particularly important in states having many miles of unimproved roads. The use of the cotton cloth is said to hold road materials together and thus give added strength to the surfacing material, preventing corrugations from forming, and lengthening the life of the road.

In concrete roads, the use of the cotton fabric involves insertion of the fabric horizontally between two layers or sheets of concrete to permit the top course to be removed for repair or replacement without breaking into the road foundation. This process, which is a patented one, has been employed to some extent on bridges and viaducts and roads subjected to heavy traffic. Its advantages are claimed to lie principally in the ease and speed of repair and the reduction of traffic delay.

Tests of this type of road construction are also being made in Great Britain, according to information received by the U. S. Bureau of Public Roads. At Burnley, in Lancashire, the fabric is being tried out in waterbound macadam construction. In this case it is believed that the cloth will act as a waterproofing agent, keeping the road surface watertight and checking disintegration.

—*U. S. Daily.*

* See THE AMERICAN CITY, August, 1930, page 145.

More One-Lane Pavements Needed

HOW the problem of providing pavements which will be serviceable throughout the year at low first cost and low upkeep cost can be met is shown in the statement by Samuel Knopf, Principal Assistant Engineer, Delaware Highway Department:

"Relative to one-lane concrete roads, we have always believed that they have a proper place in our highway system. Our state, with the exception of the area around Wilmington, is purely agricultural. With no local available material, aggregates for any kind of roads have to be imported into the state, and a one-lane concrete pavement requires a minimum of material. The roadways in these areas carry relatively light traffic of a local nature, but with a proportionate amount of truck traffic for a large part of the year. The farmer is primarily interested in getting his produce to market and he wants to haul full loads of legal limits any day he sees fit. This requirement has to be met.

"Another factor was to build a road of low maintenance cost, so that when the widening time arrived, the original investment would still be preserved. Calculations based on all considerations indicated to us that genuine maximum economy lay in the building of a single-lane, high-type surface of cement-concrete. We believe we have been justified by the building of nearly 80 miles of this type during the past four years, and that over a period of years, taking into consideration first cost and maintenance and the cost of the operation of motor vehicles, this type of pavement will be cheaper than the lower-type pavements.

"Delaware's maintenance cost on single-lane concrete roads averages about $95 per mile yearly, which includes all work between right-of-way lines, such as cutting grass and weeds three times a year. Of this amount, not over $25 per mile would represent slab maintenance. These pavements are built on the same typical section as a 20-foot concrete pavement. The only exception is that the single lane is placed to one side of the center line. The building of single-track concrete roads is no new development. They have been built since 1913 and all of them are giving good service. Their general use extends to 21 states in the Union in over 121 counties, and to date over 2,000 miles of this type have been built."

The Seawall of the Lake Ponchartrain Development

SELLING a public improvement to the public and at a profit to the city is a rather unique phase of the $41,000,000 Lake Ponchartrain development project which New Orleans, La., is rushing to completion. Civic reclamation of waste land is a time-honored practice, but it is seldom that a project reaches the scope of the New Orleans enterprise.

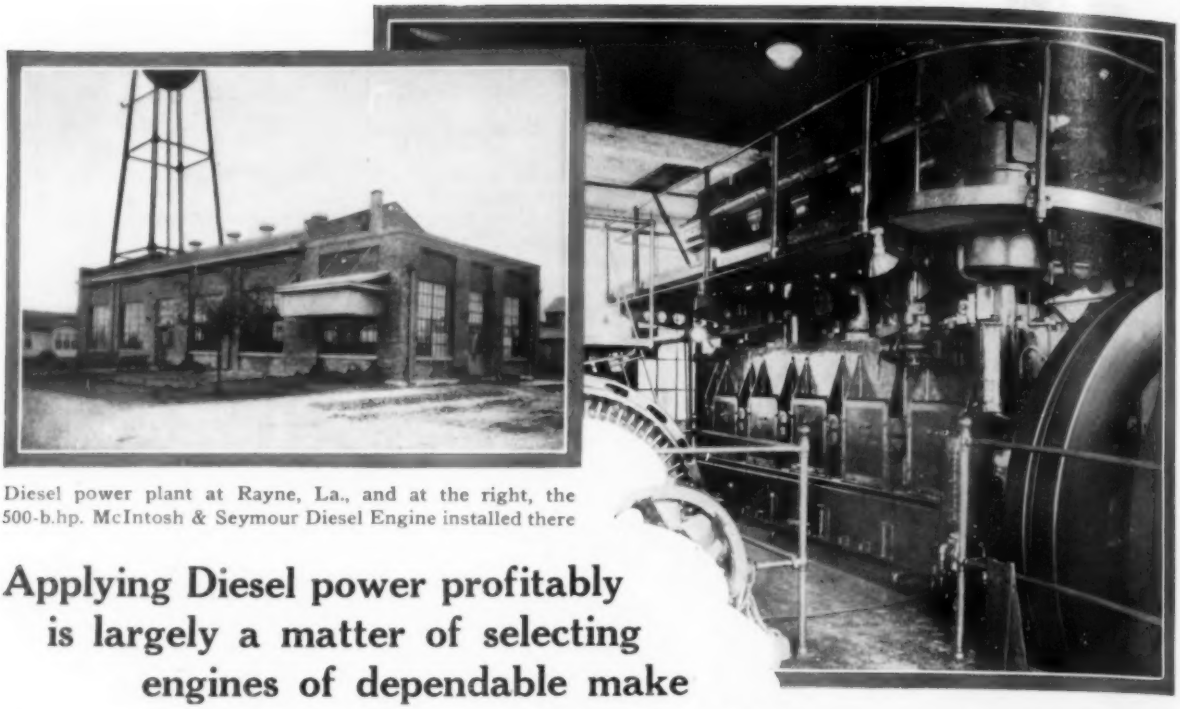
In the first place, Lake Ponchartrain figures in the new flood-relief plan for the lower Mississippi as a diversion pond. Hence, for the protection of the city, a seawall was necessary. With a seawall in place, much valuable land could be made from what was normally a swamp area. Thus, as a result of one factor developing another, New Orleans has embarked on the development of 1,900 acres of exceedingly valuable residential property, and the value presented will more than pay the city for its expenditure.

The primary feature in the development of this new property is the seawall, erected at a cost of $2,000,000 and now practically completed. From an engineering standpoint, the wall has a number of notable features. Practically one-third of the concrete used in the wall, and the same part of the total cost, is contained in the sheet piles below ground. Considering the entire bulk of the structure, this indicates the importance placed upon the necessity for providing an adequate cut-off wall to prevent erosion of the backfill.

The concrete sheet piles are of an interlocking type and run to an average length of 30 feet. The cut-off wall is 9 inches thick and acts as a support for the toe of the superstructure. The visible portion of the wall is of step-type construction, similar to other wall sections along the Gulf at Biloxi, Gulfport and Pass Christian. The top of the wall is 9 feet 3 inches above mean lake level and is built in 40-foot sections, each section separated from the next by a 1-inch premolded interlocking tongue - and-groove expansion joint. A minimum thickness of 12 inches is specified for the step slab.

In order to secure quality construction with maximum economy, water-cement ratio specifications for the concrete are being adhered to. All monolithic construction is required to have a minimum strength of 3,000 pounds per square inch. In all, the project will require a total of 63,610 cubic yards of concrete. The Orleans Dredging Co., of New Orleans, are the contractors.

JOHN KLORER,
Chief Engineer, New Orleans Levee Board.



Diesel power plant at Rayne, La., and at the right, the 500-b.hp. McIntosh & Seymour Diesel Engine installed there

Applying Diesel power profitably is largely a matter of selecting engines of dependable make

DIESEL power is supreme for small and moderate-size plants where water is scarce or too foul for economical use in boilers and condensers, where fuel oil at moderate cost can supplant coal transported from a distance, where high construction costs and land values prohibit large buildings, and where cleanliness is essential.

Diesel power is also preferable for the majority of average plants of these sizes if the engines selected are capable of sustained initial efficiencies at low operating and maintenance expense and can be relied upon for freedom from service interruptions.

The popular trend toward good Diesel prime movers comes largely from the able engineering research, conservative design and conscientious construction that have accompanied every effort of this corporation in the Diesel field. Now, with a long list of achievements and convincing service records to their credit, and with the backing of the country's foremost Diesel manufacturing organization, McIntosh & Seymour Engines can be installed with every assurance of the highest return per dollar invested.

A staff of experienced power engineers is at your command for free consultation and study of your needs, and will submit recommendations, attractive performance and cost figures and liberal guarantees.

McINTOSH & SEYMOUR CORP., AUBURN, N. Y.

***Division of* American Locomotive Company**

New York City, 30 Church Street
Kansas City, Mo., 1016 Baltimore Ave.
Jacksonville, Fla., 412 Bisbee Bldg.
Houston, Tex., 2408 Esperson Bldg.
San Francisco, 514 Matson Bldg.

McINTOSH & SEYMOUR DIESEL ENGINES

Why a good Diesel plant should have first consideration:

Sustained high fuel economy at all loads, unit power costs almost as low in a small as in a large plant

Dependability for long runs in 24-hour service and under constant heavy load

Long useful life with low operating and maintenance expense

Instant starting without standby loss

No troubles from bad or scant water supply

No noise, smoke, dust or unsightly surroundings to antagonize neighbors

A simple compact plant without boiler room, large pressure lines and complicated auxiliaries

Multiple unit operation without impaired economy. Capacity increase may be effected in easy stages as needed

Wide range of types, speed and unit sizes to meet main or auxiliary requirements

Who's Who in City & County Engineering

One of a Series of Portraits of Engineering Officials Which Has Appeared Monthly Since April, 1928

J. M. EAKIN
City Engineer
Sandusky, Ohio
(Appointed 1921)

WILLIAM D. COOPER
County Engr. & Surveyor, Marion Co., Palmyra, Mo.
(Appointed 1924)

HENDRICK LEACH
City Engineer
Conneaut, Ohio
(Appointed 1919)

HENRY T. ALEXANDER
City Engineer
Lorain, Ohio
(Appointed 1930)

EDGAR STROTHER
County Engr., Moniteau Co.
California, Mo.
(Appointed 1928)

GEORGE F. DRISCOLL
City Engineer
Chillicothe, Ohio
(Appointed 1931)

GUY HERBERT ELBIN
Village Engineer
Ada, Ohio
(Appointed 1924)

IVOR L. SHIPLEY
County Surveyor, Worth Co.
Isadora, Mo.
(Appointed 1928)

H. L. KNIGHT
County Surveyor, Sullivan Co.
Milan, Mo.
(Appointed 1928)

BRUCE D. GREENSHIELDS
Village Engineer
Granville, Ohio
(Appointed 1926)

V. E. OHL
Supt. of Streets
Clairtown, Pa.

W. G. CONRATH
Asst. Supt. of Streets
Chicago, Ill.

GOLINE DOREMUS
Deputy Chief Engr., Dept. of Public Affairs, Newark, N. J.

ROBERT H. HARDIN
City Engineer
Circleville, Ohio

safe?

You bet!

It's THE FUN-FUL LINE PLAYGROUND EQUIPMENT

Have You Seen the 1931 Fun-Ful Equipment?

SAFETY. That is the pre-eminent quality of FUN-FUL Playground Equipment, built in by the rigid specifications formulated in Hill-Standard's thirty-one years of leadership. Parks, Playgrounds, School Yards and the foremost Recreation Centers of America, bear witness to this.

"When You Buy With Confidence You Have Thought of Hill-Standard"

1931 sees the FUN-FUL line more varied, more attractive, with the newest features and widest range for your selection. All backed as heretofore, with our most liberal guarantee. Our experience is at your command. You are invited to come to our Factory Salesroom and inspect the latest in playground, water sports and floodlighting equipment. In any case, write for complete Catalog No. 11.

ADDRESS DIVISION "A"

HILL-STANDARD CO.

ANDERSON *Established 1900* INDIANA, U. S. A.

Largest Manufacturer of Water Sports, Playground and Floodlighting Equipment

WAY PAST THE DAYS of the old Tin Cup

Many vital improvements have been made in drinking methods, but, heading the list, is the R-S Vertico-Slant Sanitary Fountain.

This fountain never feels the touch of contaminated mouths and lips. It prevents them from even coming close to the jet that spouts the water.

The Vertico-Slant with the water passing angularly from jet to mouth makes each drink a safe and sanitary one. Write for bulletin.

RUNDLE-SPENCE MFG. CO.

446 NO. FOURTH ST. MILWAUKEE, WIS.

RUNDLE-SPENCE

LIPS CAN NOT TOUCH THE R-S NOZZLE

"Our Best Playground Idea"

Carried Out in 1930

A "Learn to Swim" Campaign

OUR most successful activity for the 1930 summer season was the "Learn to Swim" campaign for grade-school children. We have had annual periods of instruction for children for many years, but this year was outstanding in its success, for a number of reasons:

First was our tie-up with the public schools. The writer, as Director of Physical Education of the city schools, visited grade rooms, outlined the swim plan and gave to each boy and girl who did not know how to swim and wanted to learn, an information sheet and an application blank. When these blanks were returned, signed by parents, teachers exchanged them for free instruction tickets good for ten lessons. Almost 1,000 of these tickets were issued and used during the campaign, which was divided into two two-weeks sessions. About 1,800 of the 3,000 children took out blanks. Hundreds of the youngsters were brought by their parents and used up their cards.

Our schedule of classes, printed on the information sheet, provided for ten groups arranged by age and sex. The classes started promptly as scheduled the Monday following the close of school, and the children were there. Our daily average attendance for the first term of two weeks was 300 and for the second term was 225. One hundred classes were started on time.

ROY SCHACTLER,
Playground Superintendent, Yakima, Wash.

Winter Sports

BELOIT'S population, according to the 1930 census, is 23,611. Rock River runs through the city, and skating on it is very dangerous. There are many hilly streets, but there also is danger for tobogganing as there is always a street intersection at the bottom. Two of the playgrounds in Beloit have been graded perfectly flat and are well illuminated with large floodlights.

At the first freeze-up, the ground to be used as skating-rinks is soaked with water, just enough that the frost will not be drawn out, and that the water will freeze. Later on, another light application is made. In order to apply water lightly, the fire hose is laid out to the farthest corner and then water is applied while workmen work the hose back toward the hydrant. After this layer freezes, another layer is applied. We then have ice ¼-inch to ½-inch in thickness that will support a road grader for scraping and trucks with scoops for snow removal.

We find it desirable to build the ice up to a thickness of 5 or 6 inches so that during a temporary warm spell the ice may be scraped daily and skating continued for as much as a week of mild weather.

This system permits skating long before the ice on the river is frozen thick enough and long after the ice is melted too thin to bear a skater's weight.

A dirt fill was made from waste material during the summer months for a toboggan slide, and it is surprising how little hill is required when the runway is iced.

Beloit endeavors to maintain six skating rinks, and for the past three seasons a mid-winter frolic has been held at one of the rinks. The American Legion sponsors this event and solicits prizes from the merchants. Any number of sports, events, and contests are run off. The field is decorated with flags and evergreens, and an amplifier is used to furnish music from a phonograph pick-up as well as for making announcements.

C. RICKSECKER,
Superintendent of Streets, Beloit, Wis.

Announcement Coming!

These are the last of the contest entries. L. H. Weir, just back from a long vacation, is busy deciding who has won the two prizes. Announcements and his comments on the whole interesting group of papers will be published next month.

A Handicap Horseshoe Tournament

THE golf idea of establishing a player's handicap has been successfully applied to horseshoe pitching tournaments by this Department. All entrants were required to pitch 100 shoes as a qualifying round. The 16 men making the highest percentage of ringers were placed in the Championship Flight, the second 16 were placed in the First Flight. The handicaps were figured on the basis of 100 ringers, a perfect score being 300 points.

Say a player is rated as a 50 per cent pitcher; he would be expected to pitch 50 ringers or 150 points. He would also be expected to place the other 50 shoes in count (6 inches from the peg), or 50 more points, which would give him a total of 200 points. To find his handicap subtract 200 from the perfect 300 score, or 100. The handicap of 100 points is added to his actual total of points for 100 shoes. Each entrant's handicap was thus determined. The system brought about one of the most interesting tournaments ever conducted in Tacoma. All matches were closely contested, with many one-point and several tie games turned in.

In pitching, the crisscross system was used; each man pitched at an open peg from opposite ends of the courts. After each man pitched, he would give the score keeper his opponent's score in points, but did not pick up the shoes. Each player would then walk to the opposite peg and check his own score, pick up his shoes and repeat the process, until 100 shoes had been pitched. (We suggest square-lined paper for accurate 100-shoe count.)

WALTER H. HANSEN,
Superintendent of Recreation, Tacoma, Wash.

Building with Imagination

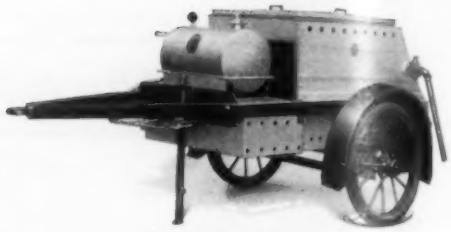
"LOOK at the playground through the eyes of a child" would be a good maxim for all of us. A cursory examination of existing playgrounds reveals an acceptance of standardization in design and construction, the total absence of romantic suggestion, the failure to appreciate the appeal of the fantastic, and a monotonous drabness in color schemes. Everyone knows that a child is attracted and intrigued by variety, romance, fantasy and gay colors. Why not apply this knowledge in designing and equipping playgrounds?

To introduce the appealing elements in playground design and construction, it is suggested that the surface of the ground be varied in contour, preserving certain areas in a level plane where needed; that equipment be located with a view to appearance; that trees, flowers and shrubs be used to add a cool, shady and attractive aspect; that the romance of fairyland, of animal lore, of invention and of frontier days be borrowed in designing playground buildings, gates, fences and apparatus; and that bright and attractive colors be used in decoration.

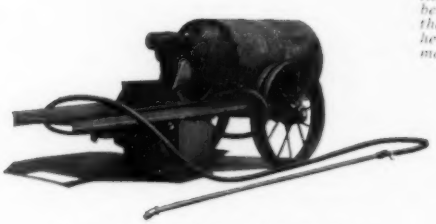
In Playland, the publicly operated amusement park of the Westchester County Park Commission, New York, a playground has been built to the specifications of the child in the manner indicated. At its entrance is the garden of "Mistress Mary," with "silver bells and cockle shells and little maids all in a row." Like most playgrounds, the apparatus is adapted to the physical size of the small children who use it, but the buildings, of child-size dimensions, include a playhouse with minature furnishings with which and in which children can "play house" in reality. This is not an ordinary house, for by ingenious design and clever use of paint its ends suggest a huge and happy face. The picket fence is a row of gaily uniformed soldiers. The apparatus is painted in colors that attract the eye—four baby swings on one frame being all of different hues with bright trimmings. The architect, to more completely build his playground to suit its child patrons, included a house for pets where bunnies, monkeys and other pets may be seen and enjoyed by the children.

GEORGE HJELTE,
Superintendent, Recreation, Westchester County Recreation Commission.

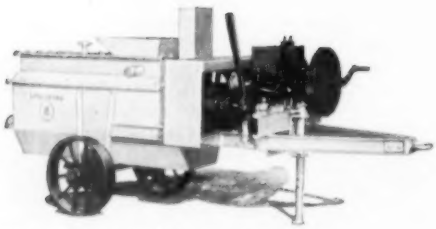
Perhaps, to keep down costs, your town desires to salvage old asphalt. No. 88-OB Reheating Pan is made for that purpose. It has a large pan designed to reclaim old material. It also has a 50-gallon A. C. tank and a place to heat tools.



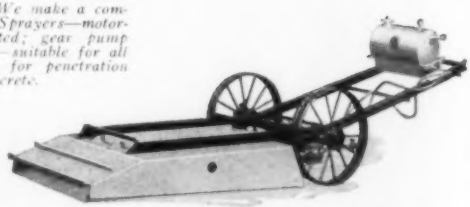
No. 90 Combination Tool Heater and Asphalt Cement Kettle is the only combination heater having positive draft control between the tool heating compartment and the A. C. Kettle. Fifteen tools can be heated within five minutes and asphalt cement is kept at proper temperature.



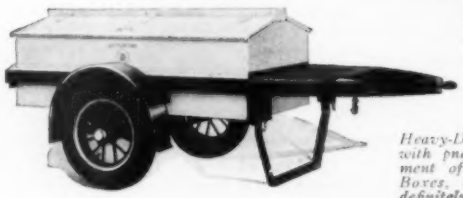
Do you use emulsions? We make a complete line of Emulsion Sprayers—motor-operated and hand-operated; gear pump and pressure pump types—suitable for all kinds of emulsions used for penetration patch work or curing concrete.



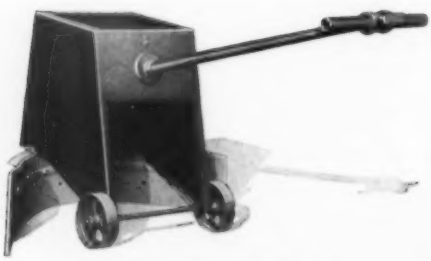
If granite and brick pavings are used in your locality, then you had better give serious thought to the LB Mechanical Grout Mixer. It is used in connection with Littleford Tar and Asphalt Kettles to mix sand and asphalt for grouting.



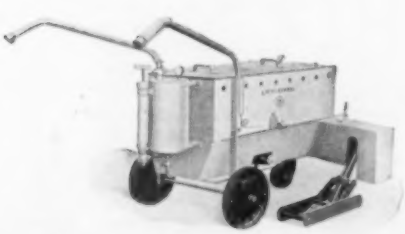
You can hardly get along without a surface heater when repairing asphalt streets. Littleford No. 98 softens the surface in a hurry. It is also used to dry out concrete before putting down asphalt, to heat brick surfaces before pouring filler, etc.



Heavy-Duty Tool Box No. T-1, equipped with pneumatic tires. Since the development of the LB line of All-Steel Tool Boxes, many highway departments have definitely given up the use of makeshift wooden boxes. They realize that both time and money are saved by protecting equipment in an LB Tool Box.



The No. 82 Squeegee Machine needs no boosting—it is a time and labor saver that has received recognition by the National Paving Brick Association for application of filler and is used extensively by contractors. Many highway departments use it for seal-coating on asphalt and concrete paving.



Very likely your highway department, like many others, has searched for a joint-filling machine that keeps asphalt hot long enough to penetrate to the bottom of the joint or crack. No. 91 Joint Filler does that very thing. It can be fitted with an automatic sanding hopper and an attachment to mark asphaltic center lines.

OUR PROBLEM

Is Highway Maintenance

Yes—we have the same problem you have—how to maintain highways economically and satisfactorily. It is your business to keep them free from cracks, ruts, pot holes, uneven shoulders, etc. Our job is to make the machines that you need for such work.

Some few highway men are under the impression that Littleford Bros. make tar and asphalt kettles and nothing else. That is wrong—we do manufacture what is probably the most complete line of Kettles offered to highway departments; but, there are many other maintenance outfits made by us that are of equal importance in road work. A number of them are shown here.

Look over these machines—Let us know what outfits are of interest to you. We will gladly send complete descriptive bulletins and prices.

THE SIGN OF A GOOD HEATER — LB — LITTLEFORD BROS. CINCINNATI, OHIO

LITTLEFORD

Road Maintenance Equipment

SINCE 1900

LITTLEFORD BROS. 500 E. PEARL ST. CINCINNATI, O.

REG. U. S. PAT. OFF.

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

Controlled Dumping in an English City

AS the result of a visit of two members of the Health Committee of Carlisle City Council to Bradford, England, to inspect the system of refuse disposal in operation there, it has been decided to adopt the system of "controlled" dumping for Carlisle.

Several examples of this method of dumping were visited, including a lawn and embankment in the grounds of a hospital within 15 feet of the windows, gardens, filling of open spaces between houses, tennis courts and park extensions, and a fine example at one point where it is proposed to build a sports stadium. The dumps present a completed appearance even when in progress, and a good deal of labor is expended in taking levels and setting out the sites, with the result that the work is orderly to the point of ornamentation.

The lines and levels of the ground are first set out and conspicuously marked by colored pegs. Roads and terraces are made with refuse, 24 feet wide, and the sides of these are sloped at an angle of 40 degrees, specially slanted at the upper edge to prevent sliding. The depth of the face and side necessarily varies with circumstances, but is said never to exceed 6 feet.

As soon as a load is dumped, all rugs, mattresses, bedsteads, cardboards, etc., are laid out flat upon the ground. Following this, boxes, cans and other hollow articles are pulled down and placed upright in the bottom of the dump and immediately filled with refuse. The remainder of the material is then raked over until the top is clear. At the end of each day the dump is properly sealed by covering with street sweepings, gully refuse, soil, or, where available, turf. Under this system, one man is allotted to approximately ten loads.

Cleaning the Central Markets of Paris

IN the January, 1931, issue of THE AMERICAN CITY, on page 21, was published an interesting photograph of a small electric tractor used in Paris, France, to help dispose of street sweepings and other refuse.

In commenting on this photograph, the General Inspector of Street Cleaning of Paris writes us as follows:

"The inscription under this picture would lead the reader to suppose that these tractors and trailers are used for the most part in the collection of the household garbage of Paris, but such is not the case. This equipment is used chiefly in the section devoted to the Central Markets of Paris. These markets and the neighboring streets form a great market-place. After the departure of the market gardeners, a large amount of débris of all sorts, such as waste from vegetables, wrapping papers, etc., litters the ground. These wastes are gathered together by the white wings and loaded into cans, which are hauled by an electric tractor to a central point. By means of cranes, mounted on automobile chassis, these cans are lifted and dumped into motor trucks, which then haul the material away for disposal. Paris uses 120 of these trailers, which are composed of a cast iron box with hinged bottom. They have a capacity of 1.35 meters, or approximately $1\frac{3}{4}$ cubic yards. Three electric tractors with a hauling capacity of 5 tons are enough to assure the collection of all the filled cans."

Street Cleaning and Garbage Collection Under One Foreman

IN the Department of Public Service of Charleston, S. C., a general foreman has charge of the Street Cleaning and Garbage Collection Division. The Garbage Collection Subdivision, which is operated under a foreman who assists the general foreman, uses one motor truck of 5 cubic yards piled capacity, three dump-wagons of 3 cubic yards each, and 23 to 27 one-cubic-yard steel dump-carts, daily.

Weather permitting, the Street Cleaning Subdivision uses daily two motor pick-up sweepers, which work from midnight until 8 A.M., and two motor trucks, which work part time, picking up the material dumped by the sweepers. One street-cleaning unit, which works 8 hours during the day, consists of a foreman, one horse-drawn broom, 10 push-broom laborers, 5 wooden-body dump-carts and 12 patrol or bag sweepers to pick up litter in prominent locations. The patrol sweepers are men who have grown old in service and are unfit for heavy work. Their wages are less than laborer's wages but amount to more than the pension allowance available after 25 years of service.

The city has no garbage disposal plant. The refuse is dumped on salt marshes, where it is spread by four laborers in charge of a dump foreman. Particular care is exercised to remove all glass from the refuse and bury it and other material which might cause injury to the mules. All classes of refuse and garbage are collected together.

The live stock of the two subdivisions consists of 49 mules, of which, depending on the day of the week or the season of the year, 33 to 38 are used daily. The surplus provides for sickness, shoeing and resting, and is a little more, at present, than is necessary, owing to the recent replacement of some of the mule-drawn vehicles by a motor truck.

The services of a veterinary surgeon, horseshoer, stable foreman and clerk and hostlers are common to the two subdivisions. Repairs to wagon and carts and to automobiles, motor sweepers and motor trucks are provided by the master mechanic in charge of the Shop and Equipment Division, the services of which are common to all the divisions of the Department of Public Service.

There is no interchange of labor personnel between the Garbage Collection and the Street Cleaning Subdivisions and, since the former uses steel-body vehicles and the latter wooden-body vehicles, there is but little interchange of equipment.

J. H. DINGLE,
City Engineer.

ONE OF THE TRAILER BOXES USED IN CLEANING THE CENTRAL MARKET DISTRICT OF PARIS BEING LIFTED BY A CRANE PREPARATORY TO DUMPING IT INTO THE MOTOR TRUCK AT THE LEFT

STREET FLUSHING
THE METHOD OF STREET CLEANING

MOTOR TRUCK FLUSHERS AND SPRINKLERS

SEMI - TRAILER AND FOUR-WHEEL TRAILER FLUSHERS AND SPRINKLERS

HVASS DOUBLE UNIT FLUSHER

Investigate the Advisability of Installing Hvass Flushers in Your City to Obtain

Sanitary, Economical and Efficient Street Cleaning Without Interference With Vehicular Traffic or Parking.

LOW COST **NO DUST RAISED** **SEWERS FLUSHED**

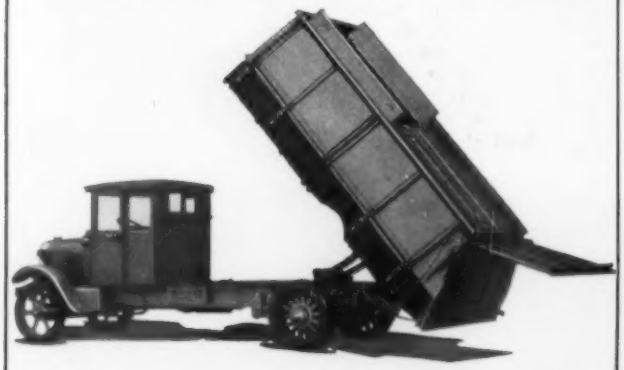
We Shall Be Pleased to Furnish Full Information on Request

CHAS. HVASS & CO., Inc.

Manufacturers—Est. 1872

OFFICE: 508 EAST 19TH ST. NEW YORK CITY, N. Y.

WOOD'S New
ALL-PURPOSE SANITATION UNIT

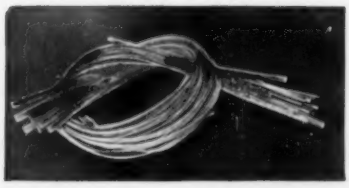


Odorless — Dustless — Watertight

This super-rugged body easily handles all types of refuse—garbage and rubbish. Loading space on top for trees and other bulky objects. Closely-lined doors and sealed seams prevent flow of dust, ashes or liquids. Low chassis mounting makes easy hand loading at sides. Sliding, self-locking side doors; easily-operated top doors for snow loading. Automatically-opened tailgate. Self-trimming. Ranges of sizes available. Write for literature.

WOOD HYDRAULIC HOIST & BODY CO.
DETROIT, MICHIGAN

HUNTSVILLE
HICKORY FIBER



for STREET SWEEPERS

HUNTSVILLE Hickory Fiber is a live, springy, flexible broom filler that handles with ease the heaviest street refuse—sweeps clean even the roughest pavements—and will give consistent and very economical service over a long period of time. Each piece of fiber is of the best selected green hickory, thoroughly cured, rigorously inspected and bears our unconditional guarantee.

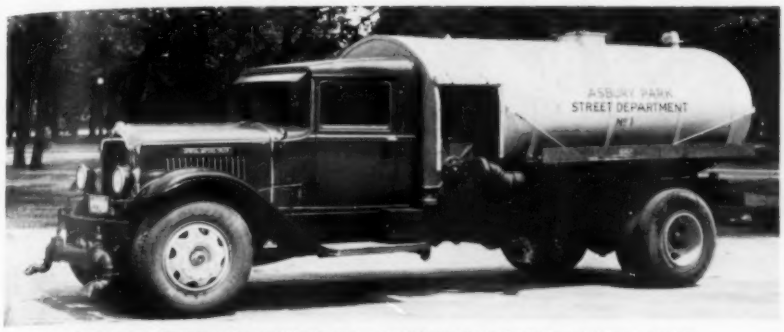
Why not write for booklet "The Story of Huntsville Hickory?" It's interesting, as well as helpful.

FAULTLESS FIBER HUNTSVILLE HICKORY FOR STREET SWEEPERS

HUNTSVILLE FIBER & VENEER WORKS
FRANK H. FORD, President
HUNTSVILLE, ALABAMA

"Keep Your Streets Clean"

Items on Street Cleaning and Snow Removal



HVASS FLUSHER MOUNTED ON A GENERAL MOTORS TRUCK, USED FOR STREET FLUSHING IN ASBURY PARK, N. J.

Street Cleaning Presents Few Problems in Raleigh

THERE are about 75 miles of paved streets in the city of Raleigh, N. C., in an area of 7½ square miles. It has been found entirely satisfactory to use two sweepers at night, two gutter trucks in the day, and one rubbish-collecting truck in the business district at night. No equipment is interchanged with the sanitary department of the city.

The business district is swept every night and the residential district twice a week. No serious problems are encountered in street cleaning in this city, since practically all streets are paved and the winters are so mild that there is seldom any problem of snow removal to contend with.

C. G. CHAPPELL,
Superintendent of Streets.

Asbury Park Finds Many Uses for Its Street Flusher

ASBURY PARK, N. J., has found its flusher of very great service in cleaning its streets at night. The work is done between midnight and morning, when there is comparatively little traffic.

The unit, which is a Hvass flusher mounted on a General Motors truck, is so equipped that it may also be used as a sprinkler on unpaved streets. It has also been used for cleaning storm drains, and sewers and for other work of this character, where it has proved very satisfactory. Because of the power behind the flushing unit, it is possible to get greater pressure from it than from the fire plugs. Also, there is the advantage of being able to place the flusher directly alongside the work in hand, avoiding the necessity of crossing the street with a hose line, which would have to be done in many cases if a fire hydrant were used.

This unit has also been found useful in placing sheet piling. In all respects, the Board of Commissioners have found that the purchase of the flusher has well repaid them.

GEORGE W. PITTENGER.
Director of Streets and Public Improvements.

Emergency Slush Removal in Indianapolis

SNOWS in Indianapolis, Ind., are of no great consequence, and, because of this, no special equipment for snow removal is required. Where practicable, the city uses flushers and several 6-foot scoops which are hitched to trucks. With these the snow is pushed into windrows, and later the trucks remove it. Most of the snow is dumped into sewer manholes, although some of it is removed to the city dumps. Generally a few hours' work suffices to clear the streets in the mile-square business section.

Ice and sleet are fought with salt sanders efficiently and quickly. Slush, however, is different. The traffic pushes it against the sewer inlets, thus blocking the flow of the water in the gutters and causing the streets to become flooded. Since slush is generally the forerunner of colder, freezing weather, its speedy removal is of greatest importance.

Slush days generally begin with a steady, drizzling rain which changes to wet, slushy snow during the night, covering the streets to a considerable depth by dawn. Speedy, hard work and lots of it is required, since the steadily sinking temperature means frost and ice. The city forces are well organized and can be shifted quickly to meet any emergencies. The Street Commissioner and his assistants take command in the business section, and the forces for the outlying districts are organized and assigned from the office as they arrive.

By 7 A. M., the flushers have washed a considerable portion of the business district, and white wings in rubber boots, equipped with street pans and shovels, keep the inlets open and push the slush into them.

Meanwhile, the forces organized in the office have been assigned, and within an hour from the start every foot of the 1,000 miles of streets is patrolled by men who keep the inlets open and get the rapidly accumulating water off the streets. So effectively is this accomplished that only a few calls for help are recorded at the office. Emergency men are dispatched at once to take care of these complaints, but before they reach these outlying localities, the crews assigned to those districts have generally found and relieved the situation. A crew consists of one truck with driver and two laborers, equipped with street pans and shovels.

The frost which usually follows in the evening causes practically no inconvenience, since it finds all streets well drained.

WILBUR H. WINSHIP,
Street Commissioner.

PHILADELPHIA STREET CLEANING DEPARTMENT USES HEAVY-DUTY TRUCKS

A fleet of new Dodge 3-ton heavy-duty trucks, purchased recently by the Department of Public Works of Philadelphia for the Bureau of Street Cleaning

CRASH!

3-FOLD principle of fire alarm transmission protects against broken boxes, pedestals and test posts

Skidding and careening motor vehicles on icy streets or in the hands of intoxicated and inexperienced drivers are each day knocking down fire alarm boxes, pedestals, and test posts. Even a backing vehicle in the hands of a careful driver is likely to add to the toll of accidents, which might break from one to several fire alarm circuits and put out of service, temporarily, scores of fire alarm boxes. Before such damage can be repaired, there is always the likelihood of an alarm for a serious fire being lost.

The new 3-FOLD principle of fire alarm transmission being introduced with the new Gamewell 1931 Model PEERLESS Fire Alarm Box, safeguards against such accidents. Whenever a box (other than one involved in a vehicle accident) is operated on a broken circuit, it is possible for the alarm to be received at the central office over whichever side of the circuit remains intact.

Fire Chiefs, Superintendents of Fire Alarm and other city officials who have a voice in the purchase of fire alarm systems, owe it to themselves and to the citizens of their city whose lives and property it is the officials' duty to protect, to investigate the new 3-FOLD principle of alarm transmission. More complete information will be sent to you upon request.

GAMEWELL

THE GAMEWELL COMPANY
NEWTON, MASSACHUSETTS
"A Box a Block"

FIRE—SAFETY—TRAFFIC

Items for Departments of Public Safety

For Safe and Speedy Arrival at Fires

A FIREMAN is exposed to many hazards to life and limb. That is incident to the service, while fighting fires. The Industrial Commission of Wisconsin points out, however, in a recent bulletin, that, strange as it may seem, more firemen are killed or injured while going to fires than at the fires. Collisions with private trucks and cars often occur while the department apparatus is speeding to fires.

Sections 39 and 40 of the Model Municipal Traffic Ordinance, if adopted and enforced, would facilitate safe and speedy arrival at fires. These sections read:

Operation of Vehicles on Approach of Authorized Emergency Vehicles

Upon the approach of any authorized emergency vehicle or vehicles giving audible signal by bell, siren or exhaust whistle, the driver of every other vehicle shall immediately drive the same to a position as near as possible and parallel to the right-hand edge or curb of the street, clear of any intersection, and shall stop and remain in such position until the authorized emergency vehicle or vehicles shall have passed, unless otherwise directed by a police officer; and the motorman of every street car shall immediately stop such car clear of any intersection and keep it in such position until the authorized emergency vehicle or vehicles shall have passed, unless otherwise directed by a police officer.

Following Fire Apparatus Prohibited

It shall be unlawful for the driver of any vehicle, other than one on official business, to follow closer than 500 feet any fire apparatus traveling in response to a fire alarm, or to drive into or stop any vehicle within the block where fire apparatus has stopped in answer to a fire alarm. (NOTE.—Municipalities may desire to substitute the words "a city block" for the limitation of 500 feet.)

Urging enforcement of provisions in the Wisconsin statute which are practically identical with the foregoing, the Industrial Commission says:

"Excessive speed with heavy fire department trucks is dangerous; but the apparatus must move with reasonable speed in response to an alarm, as the first few minutes are the important ones at a fire. Delays along the way mean a much heavier fire loss and may even result in a conflagration. For securing the lives and limbs of firemen and for the protection of property, fire department apparatus must have the right-of-way in answering alarms, and must have a clear field to work. It often happens that during the progress of a bad fire the chief desires to change the position or location of a pumper or other apparatus, but is unable to make the change on account of being blocked by private cars of meddling curiosity seekers. Policemen must help to regulate the traffic on the street and to keep private cars out of the block in which a fire is being fought. Fire department officers also have police powers at times of fires.

"It may not be out of place to caution fire-truck drivers to sound their sirens sparingly or not at all when returning from a fire. In this way the public will learn more readily to clear the roadway on hearing the siren. Returning, the fire apparatus is not privileged over other vehicles."

Uniform Motor Regulations Urged in Europe

ACCORDING to a recent announcement from the League of Nations, quoted in the *United States Daily*, the European Conference on Road Traffic is considering the formulation of a set of international standards.

This work is being carried on with the cooperation of the Union Internationale des Villes, the Association Internationale des Automobile-Clubs Reconnus, and the Alliance Internationale du Tourisme.

A draft convention has been prepared for road signaling which includes triangular danger signs, rectangular speed-limit signs, signs prohibiting passage or parking (round, blue, blue and white) indicating the direction to be followed, or parking, etc. It is proposed that these signs be substituted for those which are non-uniform within a maximum period of five years from the coming into force of the convention.

Why Not Uniform Street Name Signs with Reflecting Letters?

STREET signs remain a relic of buggy-riding days, declares an editorial in *The Christian Science Monitor*.

"A statistician could doubtless compile an astonishing array of figures as to hours wasted and traffic impeded by the stranger in his perplexed efforts to locate any given destination within town or city limits after sundown—or even before.

"Timely cooperation on the part of those cities and towns where the street marking has not been modernized," the writer urges, "would do much to alleviate the motorists' problem and encourage good-will."

Physical conditions vary. "In some southern states the names of the streets are painted on the curbings and are clearly visible day or night. In the northern states where the curbings are often covered with snow or inundated with mud and rain, this method probably would not be practicable.

"However, signs of a uniform type—possibly of the approved model now used on state highways, white metal ground with glass crystals forming the letters—placed at a height to come within the radius of the light of an approaching motorcar, could be erected at every street intersection and terminus. If large enough to be legible at a considerable distance, these signs would save the congestion which now results when a driver slows down or stops to make out a name. *Such improvements would certainly do much to speed traffic on its way rejoicing.*"

A Model Fuel Oil Burner Ordinance

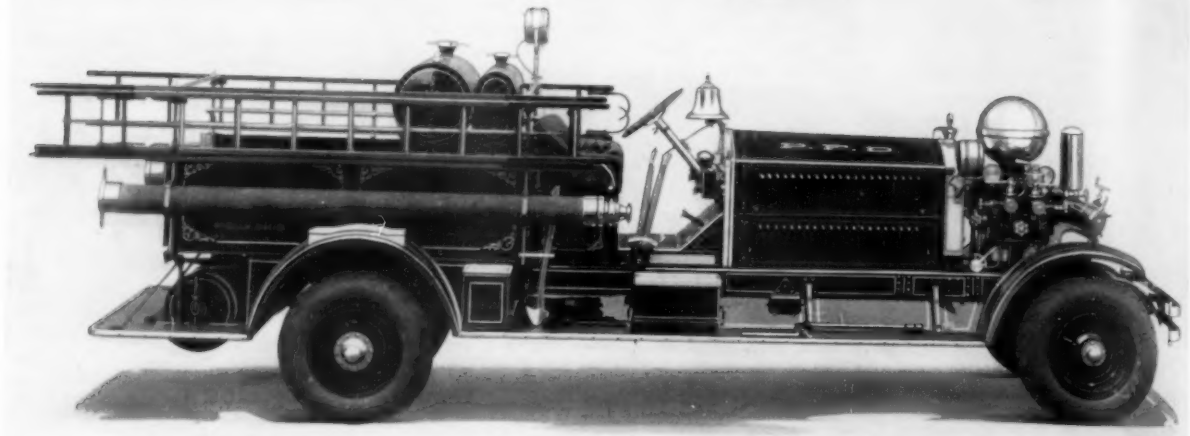
USELESS and obsolete ordinances such as impose heavy costs upon home owners and taxpayers have been the object of recent studies by governmental and trade standardization bodies. In the oil-burner industry alone, the cost of out-of-date regulations has been estimated at $10,000,000 per year. The American Oil Burner Association, responsible for recent extensive surveys of existing conditions, is responsible also for a Model Ordinance Governing the Construction and Installation of Oil-Burning Equipment and for the Storage and Use of Fuel Oils in Connecting Therewith. This ordinance is based upon the regulations of the National Board of Fire Underwriters "modified in accordance with good practice and experience." The state of Michigan has an enabling act which embodies the essential requirements of the ordinance, and the ordinance has been in effect in Detroit since 1925. It has recently been adopted in Minneapolis in practically unchanged form. Following is a list of other cities which have adopted it wholly or in part:

Rockville Center, N. Y.	Bridgeport, Conn.
Lynbrook, N. Y.	New Haven, Conn.
North Hempstead, N. Y.	Flint, Mich.
New Brunswick, N. J.	Williamsport, Pa.

In publishing a new edition of this model ordinance for proposed local legislation and making it generally available just now, the Oil Heating Institute (342 Madison Avenue, New York) feels that it is aiding public officials and representatives of the industry "to serve the best interests of their communities by elimination of careless and inferior installation work by uninformed and irresponsible persons."

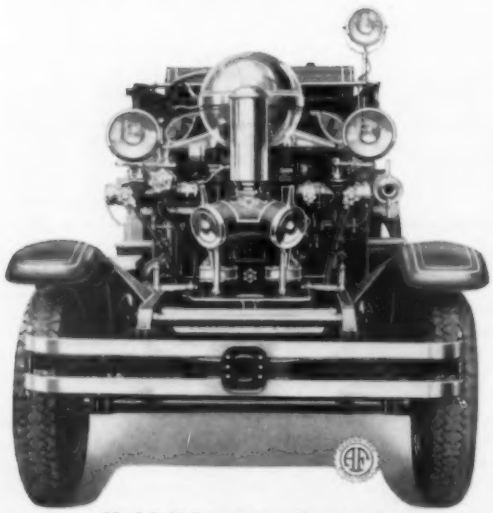
The Department of Traffic Control and Facilitation, which is now a regular monthly feature of THE AMERICAN CITY, begins on page 153 of this issue.

AHRENS FOX



Model N-S-4—1000-Gallon Triple Combination

CONTINUOUS ACTION UNDER EVERY CONDITION



Model N-S-4—1000-gallon triple pumping engine. A combination of modern design, expert craftsmanship and high-grade materials. Built for enduring efficiency, and as beautiful as a watch

HOUR after hour . . . temperature below zero or 90 degrees in the shade . . . this Ahrens-Fox piston pumper keeps on working as if conditions were ideal.

Any fire chief would be pleased to have this unit roll up to the scene of the fire. It means speed and efficiency — and continuous action as long as there is water to be pumped.

Any municipality would be proud to own equipment such as this.

Once demonstrated, folks know they can rely upon it to effectively supplement the efforts of the firemen, and stay on the job. There's no secret about it. It is the cumulative effort of Ahrens-Fox engineers over a long period of years to produce the best fire-fighting equipment that human skill can construct.

Consider its advantages before you make a decision. Get the information anyway. You'll want to keep it for reference.

THE AHRENS-FOX FIRE ENGINE COMPANY

CINCINNATI, OHIO

Without obligation on my part, send complete details of Model N-S-4.

Name .....

Address .....

City ..... State .....

J. H. SPEDDY
Chief, Fire Department
Lakewood, Ohio

GEORGE W. BOOTH
Chairman, Contest Grading Committee and Chief Engineer, National Board of Fire Underwriters
New York City

TERENCE F. CUNNEEN
Manager, Insurance Dept., Chamber of Commerce of the United States
Washington, D. C.

ROSS B. DAVIS
Fire Chief
Philadelphia, Pa.

WALTER S. PARSONS
Chairman, Fire Prevention Committee
Lakewood, Ohio

Winners of Special Distinction in the 1930 Inter-Chamber Fire Waste Contest

The portraits on this page are those of fire department officials and committee chairmen or chamber of commerce executives chiefly responsible for the activities which brought first-place awards in their respective population groups in the 1930 contest of the National Fire Waste Council. The winners and honor cities in the different population groups are published at page 23 of the April issue of The American City.

The awards are being made at the annual convention of the Chamber of Commerce of the United States, meeting at Atlantic City April 29 to May 1, 1931. The portraits of the Chairman of the Contest Grading Committee and of the Manager of the Insurance Department of the National Chamber are also shown.

How Lakewood won the grand prize for cities of all sizes is told on page 122 of this issue.

GEORGE W. ELLIOTT
Secretary, Chamber of Commerce
Philadelphia, Pa.

WILLIAM J. CREEGAN
Chief, Fire Department
Rochester, N. Y.

WILLIAM B. PLATT
Chairman, 1930 Fire Prevention Committee, Chamber of Commerce
Rochester, N. Y.

FRED P. HIGGINS
Deputy Fire Marshal
Grand Rapids, Mich.

OWEN P. DAVIES
Chairman, Fire Prevention Committee, Safety Council
Grand Rapids, Mich.

J. I. FETTERS
Fire Chief
Mishawaka, Ind.
(Appointed 1930)

E. L. BACH
Secretary-Manager, Chamber of Commerce
Mishawaka, Ind.

D. W. BROSNAN
Chief, Fire Department
Albany, Ga.

HATTIE HARDY
Secretary, Chamber of Commerce, and Chairman, Fire Prevention Committee, Albany, Ga.

A REVOLUTIONARY NEW FIRE ALARM SYSTEM

Gives stations the exact location of the blaze instead of the nearest box number!

Now that most fires are reported to headquarters by telephone, old-fashioned fire alarm systems which send only box numbers to the various stations are proving woefully inadequate. For even though the headquarters operator knows the actual location of a fire, he can do no more than give the stations concerned the number of the nearest box... which may be blocks from the blaze.

The precious moments now lost by firemen in running down fires can be saved by installing Teletype... an amazing machine that sends typewriting over telephone or fire alarm system wires. By means of it headquarters can flash the *exact* address of a fire to any one station, to any group of stations, or simultaneously to all stations.

Teletype has a capacity of 370 letters or figures per minute. It is operated just like a typewriter, and prints its messages in a continuous line on a narrow paper tape. For further information consult your local telephone company or write direct to the Teletype Corporation, 1400 Wrightwood Ave., Chicago, U. S. A.

TELETYPE

SUBSIDIARY OF

Western Electric Company

INCORPORATED

Mention THE AMERICAN CITY—it helps.

MAY, 1931

Vol. XLIV, No. 5

The American City

470 Fourth Avenue
New York

50 Cents, $4 a Year

The Water Supply of Pittsburgh, Pa.

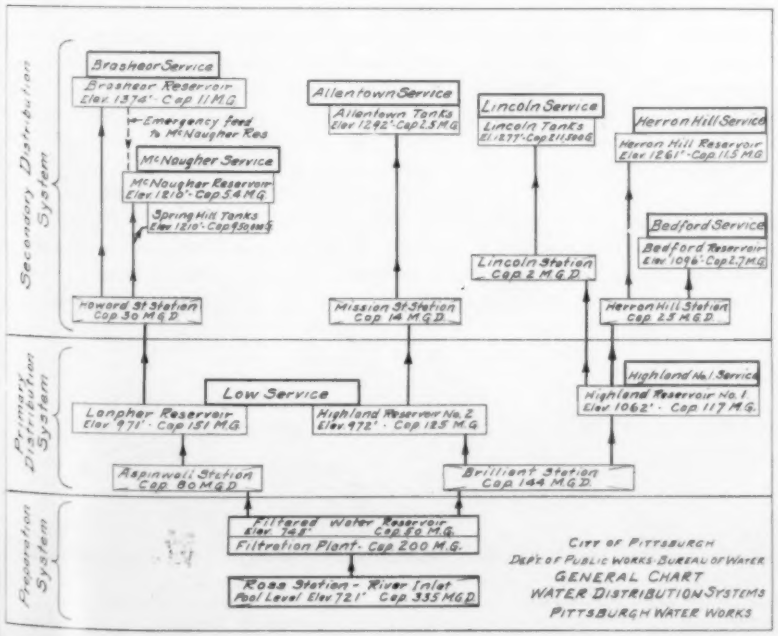
Rivers Constitute Major Sources for Domestic Uses

THE ROSS PUMPING STATION
The raw-water pumping station which delivers the Allegheny River water to the filtration plant

THE water supply for Pittsburgh today is of high quality and practically inexhaustible, as it is drawn from the Allegheny River. The dry and hot period experienced during July and August, 1930, caused some anxiety, because there are many works, power stations and locks drawing heavily on the water dammed up in the stream and a meager amount flows into the river from small streams.

Historical

In February, 1824, a committee of five prominent citizens was appointed to arrange a loan of $50,000 to be used in installing a water-works system for Pittsburgh. In 1826, the Mayor was authorized to negotiate a loan of $40,000. In June, 1826, a reservoir site on Grant's Hill and a pumping-station site at the foot of Cecil Alley were purchased. The system was reported ready for service in September, 1828. In 1832, the system was in good working order after a total expenditure of $111,000. At the present time the reproduction valuation of the entire water works of Pittsburgh is $65,000,000.


Secondary Distribution System
Brashear Service
Brashear Reservoir Elev. 1374' · Cap. 11 M.G.
Emergency feed to McNaugher Res.
McNaugher Service
McNaugher Reservoir Elev. 1210' · Cap. 5.4 M.G.
Spring Hill Tanks Elev. 1210' · Cap. 930,000 G.
Howard St. Station Cap. 30 M.G.D.
Allentown Service
Allentown Tanks Elev. 1242' · Cap. 2.3 M.G.
Mission St. Station Cap. 14 M.G.D.
Lincoln Service
Lincoln Tanks El. 1277' · Cap. 1.1 M.G.
Lincoln Station Cap. 2 M.G.D.
Herron Hill Service
Herron Hill Reservoir Elev. 1261' · Cap. 11.5 M.G.
Herron Hill Station Cap. 2.5 M.G.D.
Bedford Service
Bedford Reservoir Elev. 1096' · Cap. 2.7 M.G.
Primary Distribution System
Low Service
Lanpher Reservoir Elev. 971' · Cap. 151 M.G.
Aspinwall Station Cap. 80 M.G.D.
Highland Reservoir No. 2 Elev. 972' · Cap. 185 M.G.
Highland No. 1 Service
Highland Reservoir No. 1 Elev. 1062' · Cap. 117 M.G.
Brilliant Station Cap. 144 M.G.D.
Preparation System
Filtered Water Reservoir Elev. 748' · Cap. 50 M.G.
Filtration Plant · Cap. 200 M.G.
Ross Station - River Inlet Pool Level Elev. 721' · Cap. 335 M.G.D.
CITY OF PITTSBURGH
DEPT. OF PUBLIC WORKS · BUREAU OF WATER
GENERAL CHART
WATER DISTRIBUTION SYSTEMS
PITTSBURGH WATER WORKS

In 1926, a bond issue of $3,900,000 was authorized, and a large part of this has been expended in improvements such as reconstruction of the baffle-walls in the sedimentation basins of the filtration plant, additional mains from the pumping station, repairs and strengthening of the distribution reservoirs, improvement of the pumping stations, extension of the gridiron system new districts, and the laying of larger pipes in under-supplied districts. One extension in 1930 was made into Shaler Township, which increased in population from 6,300 in 1920 to 9,600 in 1930.

Briefly, the water-supply system, exclusive of Brushton and a portion of the South Side, which are supplied by private water companies, consists of eight pumping stations, a slow sand filtration plant, 5 reservoirs, 12 tanks, all with a storage capacity of 413,000,000 gallons, 812

THE McNAUGHER RESERVOIR
A secondary reservoir completed in 1928, which consists of two circular concrete units of 5.5 million gallons total capacity

miles of pipe in the gridiron system, ranging from 4 to 66 inches in diameter, 7,483 fire hydrants, 44,475 meters, 18,993 distribution valves and 105,382 service lines. The average daily consumption is about 125,000,000 gallons.

Source and Treatment of Water

Near Aspinwall, a suburb on the west bank of the Allegheny River, are two pumping stations, one, the Ross Station, with five pumps, lifts the river water to the sedimentation basin. Its capacity is 255,000,000 gallons per day. The intake consists of one 124-inch concrete suction tank and two parallel conduits 84 inches in diameter. The water then passes through the slow sand filters, after which it is treated with liquid chlorine at the rate of approximately one pound of chlorine to every 8,300,000 pounds of water treated. No coagulant is used.

The water then passes into a covered filtered water reservoir about 25 feet deep and holding 2,000,000 gallons per vertical foot. The pumps at the Aspinwall station take the water from the east end of the filtered water reservoir and deliver it to the North Side reservoir, lying back of Millvale. This reservoir has a capacity of 148,000,000 gallons and is 40 feet deep.

From the west end of the filtered water reservoir, two 72-inch steel pipe lines run under the Allegheny River to the Brilliant pumping station. This plant pumps to Highland Reservoir No. 1 with a flow line about 344 feet above pool level at Brilliant, and to Highland reservoir No. 2 with a flow line of about 252 feet above pool level at Brilliant. These reservoirs are stocked with carp, which are an evening attraction to visitors.

A third group of pumps lifts up the water to higher reservoirs and standpipes for hill service, and a fourth group of pumps boosts the water still higher to the highest hill service. A drive around Pittsburgh shows the visitor the hilly character of the city and suburbs and the difficulty in supplying water. As an illustration, the West View Park district, North Side, is 6 miles from the river pumps at Aspinwall and the water is stepped up in four stages by four different sets of pumps.

Laboratory Checks Quality of Water

As a check on the purity of the tap water and as a preventive of outside contamination, approximately 100 chemical and bacteriological analyses are made daily of samples collected in the various parts of the water-works system, but as many as 300 have been made per day.

At one time, prior to 1908, when filtration was started, deaths from typhoid fever were as high as 122 residents per 100,000 inhabitants. This was in 1904. In 1907, the rate was 108.6; in 1908 it dropped to 42.6; in 1911, it was 20; in 1912, 8.1; in 1926, 1.4; in 1927, 1.5; in 1928, 2.1; and in 1929, 0.6. During the first six months of 1930, there was only one case of typhoid, that of a non-resident who came to the city. The relatively high rate in 1928 was the result of two picnic parties which were not careful about the water they drank.

Water-Waste Surveys

All water-supply systems leak more or less, sometimes seriously. In Pittsburgh, the Bureau of Water has made a scientific study and search of each main by means of the aquaphone and the geophone. During the first six months of 1930, leakage totaling 3,222,000 gallons a day was detected and stopped in the South Side alone.

The present plant serves 37 square miles of territory and 700,000 people with an average of 118,000,000 gallons per day at an average pressure of 79 pounds. The filtration plant has a capacity of 50,000,000 in excess of consumption, and the pumps can handle double this consumption.

Private Supply—South Hills Area

The South Hills area of Pittsburgh, which has a population of 220,000, is supplied by the South Pittsburgh Water Co. Water is taken from the Monongahela River near the city proper, neutralized with lime and then pumped through two 24-inch cast iron pipes to the softening plant. Here, after aeration for removal of carbon dioxide, a solution of lime and soda ash is added continuously to the water in four 30 x 20-foot mechanical agitators. The overflow from these passes into an 80 x 20-foot thickener. The condition of the river water determines how much water is to be treated at the softening plant. An average demand is about 12,000,000 gallons per day, and the capacity is 20,000,000. Not all of the water is treated. Some of it is bypassed to the filtration plant, where it mixes with the softened water, and all is filtered, producing a water of proper purity and hardness.

THE LANPHER RESERVOIR, LARGEST OF THE PITTSBURGH WATER WORKS
which has a capacity of 151 million gallons and a 40-foot depth of water. This reservoir was renamed in honor of the late Managing Engineer, E. E. Lanpher, under whose supervision it was constructed in 1912-14

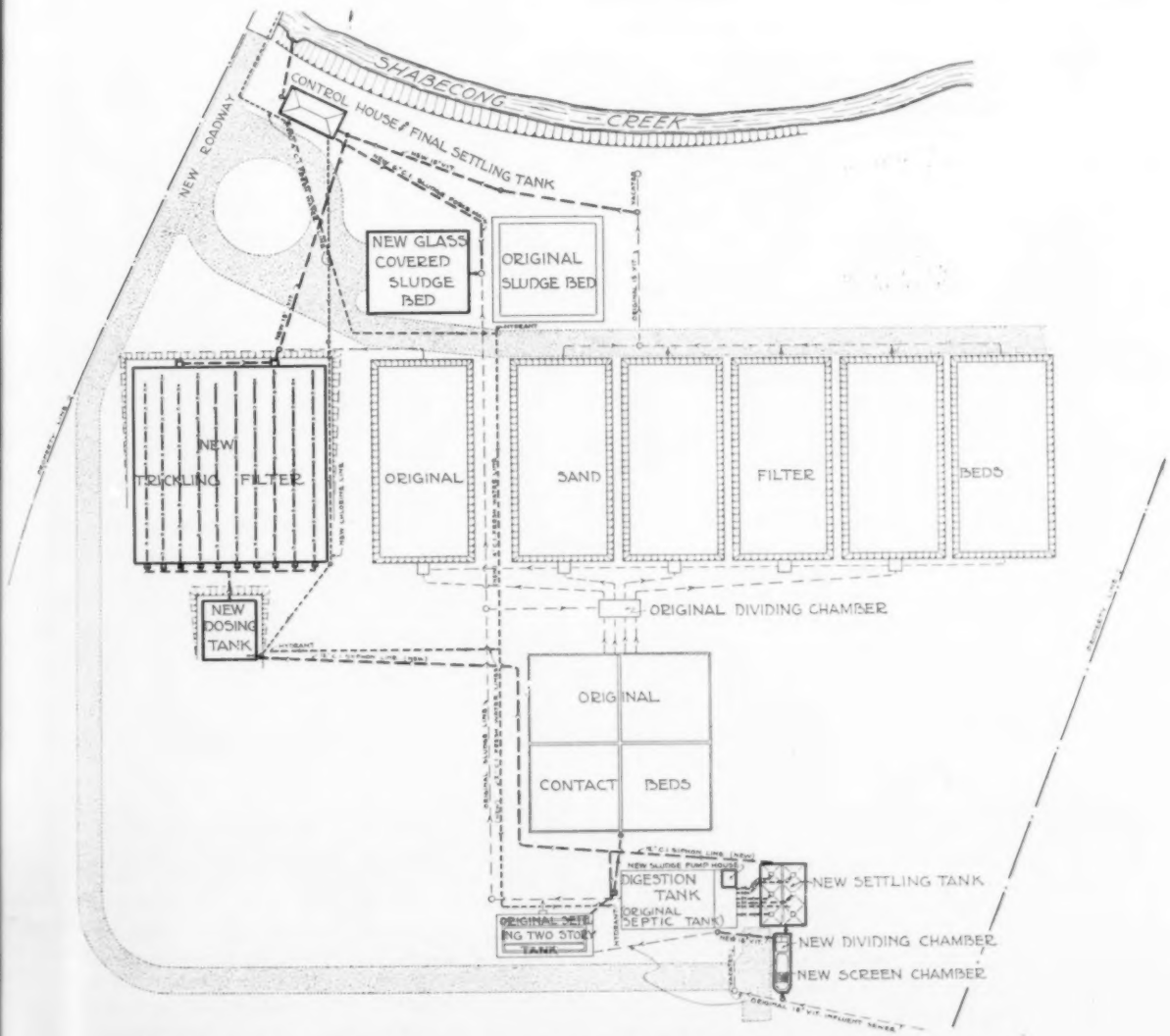
Twenty Years Ago and Today—Modernizing a Sewage Treatment Plant

By **THOMAS F. BOWE**
Consulting Engineer, New York City

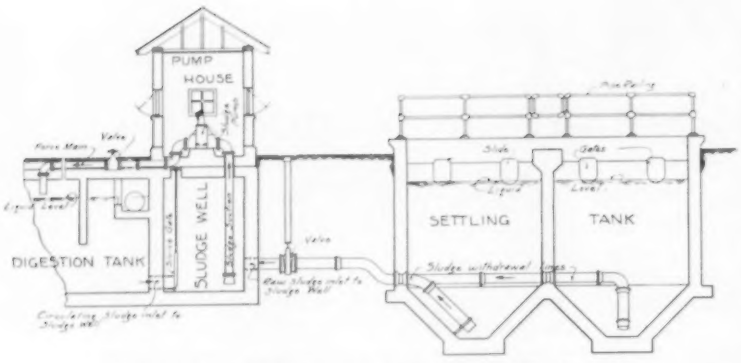
THE borough of Washington, Warren County, N. J., is typical of the better class of America's self-sustaining towns. Although it is largely residential in character, there are few, if any, commuters; local industry and business providing for its 4,000 inhabitants. All the modern utilities have been installed, including a sewerage system with sewage treatment works which have been in service for about twenty years. Additions have been made to both the original sewers and the treatment plant from time to time as needed. Recently, however, the increased flows at the treatment works required decided changes to provide for the variable flows occurring, which seriously flooded the sand filters and caused nuisance to the neighborhood.

The behavior of the plant created an operation expenditure which became a burden on the municipality and resulted in producing an effluent far from satisfactory to health authorities and to property owners located along Shabecong Creek.

Upon study of the situation, it was found that the original works afforded less than the required capacity, particularly with respect to secondary treatment. The primary treatment units included a concrete-covered, flat-bottomed septic tank with a capacity of 150,000 gallons per day, and an Imhoff tank with a capacity of 155,000 gallons per day. The secondary treatment consisted of contact beds discharging directly to sand filters with an estimated efficient capacity to treat approximately 190,000 gallons of sewage per 24 hours. The open sludge drying beds



GENERAL PLAN OF THE RECONSTRUCTED SEWAGE TREATMENT PLANT, WASHINGTON, N. J.



SECTIONAL ELEVATION OF SETTLING TANK, SLUDGE WELL, AND DIGESTION TANK

were found to be ample in area, but tests displayed that the drainage medium was unsuitable.

Enlargement Necessary

The analysis of existing and probable future flows dictated that the plant should be enlarged so as to have a capacity throughout the various units of 400,000 gallons per day. Additions, planned and constructed, utilized in the most economic manner all original units without reflecting adversely on the results demanded. Because of improved operating conditions anticipated by separating the functions of sedimentation and digestion, it was decided to construct new settling units and utilize the original covered septic tanks for separate sludge digestion. The lack of available area for extending the sand filters precluded the adoption of this method for augmenting the sewage works. Considering the relatively large fall through the plant, the use of trickling filters for secondary treatment appeared feasible and economical. Other pertinent factors concerning the effluent requirements confirmed the selection of this treatment.

The New Grit and Screen Chamber

Preceding the settling tanks, a new grit and screen chamber was constructed consisting of two compartments, either of which was designed to maintain a velocity of one foot per second for the designed flow. In this unit, bar screens with 1½-inch clear openings are provided for removing rags and other deleterious matter. At the outlet end, and built monolithic therewith, is the dividing chamber where, by means of weirs, the incoming flow is automatically apportioned to the capacities of the original two-story tank and the new settling compartments. Stop plates are provided to decrease or to cut out entirely the flow to either, if desired, thus increasing the flexibility of the plant's operation.

Settling Tanks

The Imhoff tank with but slight alteration was retained in service. A diverting manhole was constructed so that the effluent therefrom may receive treatment by either or both the new or original secondary units.

A new hopper-bottomed settling tank, consisting of two compartments each having three hoppers, with a slope of 1 to 1, was constructed. Draw-off piping of 8-inch diameter was installed for removing sludge by gravity to a former detritus compartment in the original septic tank, now used as a sludge inspection well. A motor-driven bronze plunger pump was installed within a brick housing for lifting the sludge from this well and discharging into either or both compartments of the original tank now used for separate sludge digestion.

Alterations to this unit also included the installation of sluice-gates so that sludge from the lower portion of the digestion tanks can now be drawn into the sludge inspection well and thence discharged by the pump to the upper portion of the digestion tanks. The effect of this circulation is to increase the efficiency of the tanks and to expedite the formation of a well-digested material with a small water content, thus accelerating the drying and facilitating the necessary handling.

Sludge Drying Beds

Digested material from either the original two-story tank or the separate digestion unit may be drawn by gravity and directed to the sludge beds for conditioning. A glass covering with reinforced concrete foundation was constructed over one of the original sludge beds in order to permit a regular schedule of drying, regardless of weather conditions. For removal of dried sludge from this unit, a trackway of 10-inch steel channels supported on concrete columns was provided along the center line of the bed. This runway permits the driving of a small truck into the inclosure, where sludge may now be loaded directly from the bed without rehandling.

Dosing Tank

The flow of sewage to the existing plant is so variable that the selection of any size of a single siphon to accommodate these varying conditions was not practical. In this instance, the selection of a twin compartment tank, each equipped with a siphon, was adopted. The flow to any given compartment ceases when this section is filled, the sewage being diverted to the empty unit by means of automatic operating cast iron feeds. In this manner, the sewage is applied in doses of equal volumes. Tanks are designed with sloping bottoms calculated to spray the settled sewage evenly upon each square foot of bed surface, a condition which can be approached with the use of a twin-compartment dosing tank. The principle of even doses is utilized to measure the daily volume, a counter being installed to record the number of these fillings.

Chlorine for odor control is applied at this point. A period of contact is afforded between the settled sewage and the chlorine solution, wherein the dissolved sulfide gases are dissipated, leaving no trace of this objectionable element when the liquid is sprayed into the air and upon the stone.

Trickling Filter

The trickling filter bed, designed to treat 400,000 gallons per day, was constructed as a reinforced concrete basin with central dividing wall. The concrete floor of each half slopes to a central longitudinal channel or main drain. Sluice-gates were installed at the effluent end of these channels for equalizing the rate of discharge and providing means of flooding the filters for control of flies and flushing. Upon this floor, vitrified clay channel blocks were placed and set in cement grout, the channels

formed being covered by vitrified grill blocks so designed that the openings are approximately equal in area to the voids in the filter media. Upon this grillage, crushed stone was placed to a depth of 6 feet, great care being used in order to secure a uniform product free of chips and pieces small enough to pass through the openings in the grill blocks.

The specifications for crushed stone stipulated that the material shall be "dense, hard, durable and insoluble in nature. Stone shall be uniformly 2 inches in diameter, and not more than 5 per cent may pass a 1½-inch ring nor more than 5 per cent be retained on a 2½-inch ring."

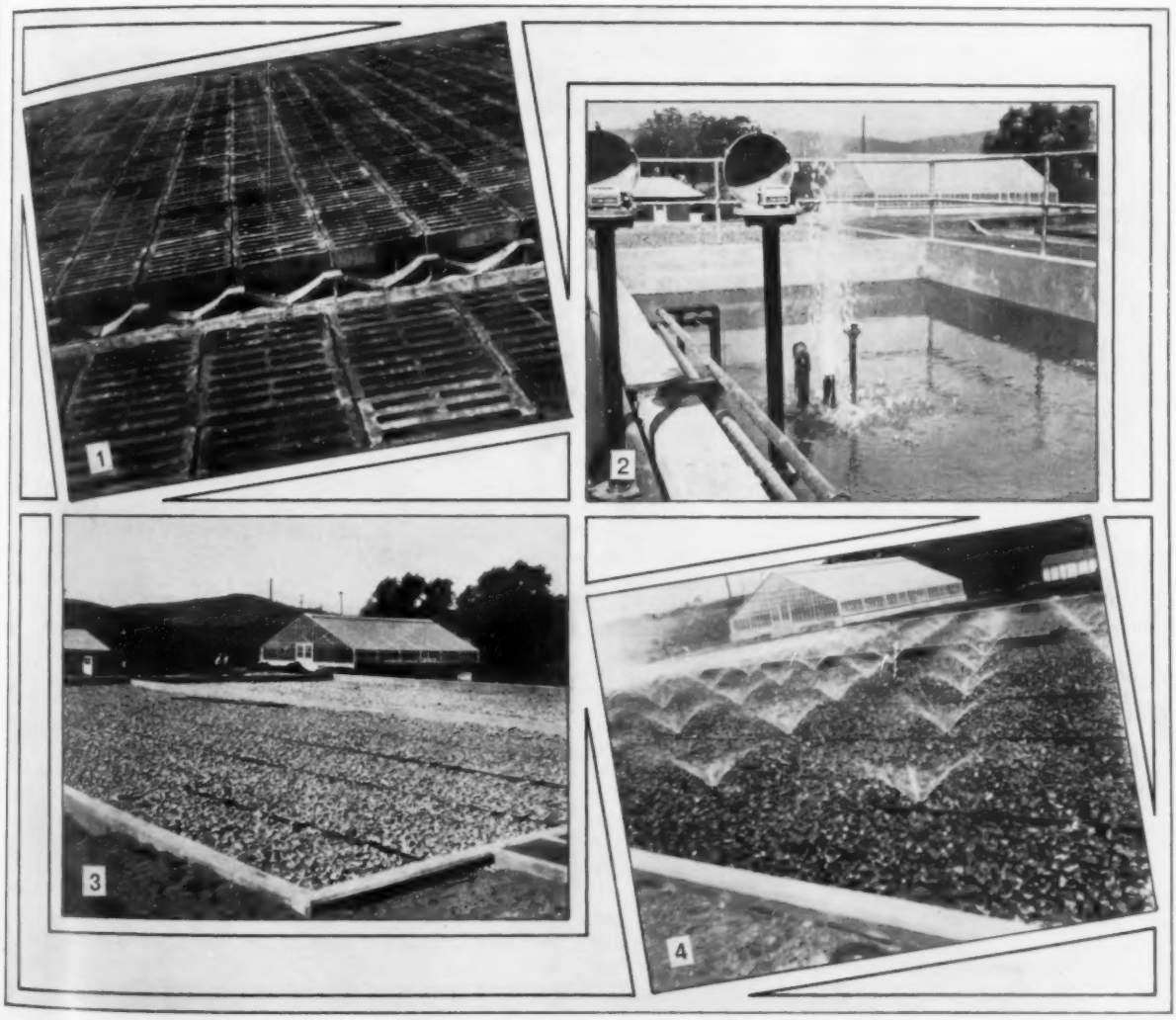
In filling the beds, trucks dumped their contents upon a bed of crushed stone previously spread by hand over the grill blocks and along the outer walls to prevent breakage. This bed of stone was extended over the entire bottom of the filter in advance of a gasoline crane equipped with a clamshell bucket which deposited the material directly in areas within its reach. The remainder was distributed by one-yard dump-trucks which operated on planking laid upon the surface of the bed and permitted flexible transportation from the crane to remote points.

There are nine rows of 6-inch Universal joint cast iron pipe laterals laid with top flush with the surface of the stone and drilled and tapped to receive the ¾-inch brass nozzles. There are ninety spray nozzles in all. These are placed on 10-foot centers, any three of which form the apexes of an equilateral triangle.

Final Settling Tank with Superstructure

The effluent from the trickling filter and also the drainage from the original sludge beds and sand filters flow by gravity to the new final settling tank. This is a reinforced concrete hopper-bottomed tank designed for the settling of the sloughed-off matter from the trickling filter and for the final chlorination of the effluent of the entire plant.

An attractive red brick superstructure equipped with green asbestos shingles was placed over the final settling tank and serves as a general administration office for the plant superintendent. This building provides a separate room for the manual control solution feed vacuum chlorinator, and the platform scale, and ample space for a



RECONSTRUCTION AND OPERATION OF THE WASHINGTON, N. J., SEWAGE TREATMENT PLANT

1. End view of the filter floor at the main drainage channel before covering with crushed stone. 2. The dosing tank at point of discharge. Note the automatic controls with the covers raised. 3. The sprinkling filter, showing the distribution piping and the sludge-bed glassover in the background. 4. The sprinkling filter in operation

reserve supply of chlorine. In addition, a lavatory and shower bath has been included. Laboratory control of the sewage treatment works is made possible by the installation of such facilities in the form of table, cabinets, running water, electrical outlets and incidental testing equipment.

A 5-horsepower motor-driven bronze plunger sludge pump is also housed herein. This appurtenance is used for the transferring of the residue deposited in the hoppers of the final settling tank to the covered sludge bed.

A graphic recording meter installed in the office gives a continuous record of the entire discharge flow from the plant as measured by the outlet weir in the final settling unit.

Water Supply

The completed additions include a 4-inch cast iron water line extended from the municipal supply to and around the plant, with flushing hydrants placed at advantageous points, as an ample supply of fresh water under pressure is a requisite for efficient and proper operation. Water is necessary, in that the chlorine solution must be applied at a point remote from the plant. Flushing of all sludge lines immediately after usage promotes cleanliness and relieves the operator of many clogged drains and pipes. The use of water also prevents the deposit of substances which, if permitted to lodge, create odors, attract flies and generally invite adverse criticism of the sewage disposal plant.

Construction Procedure

The building of additions to an existing and operating plant of any nature places a definite responsibility upon the supervision of construction beyond that usually entailed in securing conformity with plans and specifications. This is particularly true in the case of a sewage treatment works, since the purpose of this utility is such that no interruption of flow can be permitted. It is therefore a positive requirement that existing units shall be kept in service until such time as the flow may be transferred to the new additions for treatment.

In the case of the Washington treatment works, it was possible to execute most of the work on the new units before diverting the sewage flow through them. The small capacity of the Imhoff tank, however, created the necessity for retaining the original flat-bottomed septic tank in constant use. When the time arrived for converting it for use as a separate sludge digestion tank, sludge was pumped from one compartment to another, permitting the settling of the necessary gate-valves, sluice-gates and piping. This operation was carried on during exceptionally hot weather without causing nuisance to residents in the vicinity.

Operation

The new treatment plant has been in operation since the middle of September, 1930. An immediate improvement was noted in the condition of the stream below the plant. The existing sand beds which formerly flooded and bred mosquitos and odors, were soon cleaned and put in serviceable condition. The effluent from the primary settling tank indicates a 98 per cent removal of settleable solids, and the quality of the final effluent of the plant is satisfactory. This is constantly improving as the film on the trickling filter medium builds up, and, after three months, has reached a stability of 80 per cent at a season when bacterial activity is lower than normal.

Personnel

The extensions and improvements were constructed in ninety working days by Merritt-Chapman and Scott Corporation of New York City, represented by Ralph T. Stewart. The design and supervision of this work were performed under the direction of the writer as consulting engineer with James M. Kingsley as the engineer in charge of construction.

Planting Trees for Civic Beauty

By MARTIN L. DAVEY

FROM the standpoint of municipal beauty there is nothing that means so much as the intelligent and systematic planting of trees. The wisest plan to follow is to plant the streets with uniformity: one variety can be chosen for one street, and another variety for a different street. Wherever this has been done, it gives an appearance of orderliness and symmetry. It is the best plan, I think, for all planting to be done either by the city authorities or under their direction according to a definite program. Otherwise, there is apt to be not only an objectionable irregularity, but it is possible that undesirable types will be planted in some places, while other sections will be left treeless. On those streets where some trees already exist and it is desired to fill in the vacant spaces, it is best to choose the one tree that predominates in the street.

While there are other varieties that may be preferred in some cases and in certain locations, the trees which seem to be best suited for street planting are the elm, the Norway and sugar maples, the pin oak, the plane tree, and perhaps the basswood.

May I suggest in all earnestness that it is the part of wisdom to secure such trees from a reliable nursery rather than to undertake to find them in the surrounding country. Nursery-grown trees are better specimens from the standpoint of individual symmetry and general vigor, but the most important thing is that they have really good root systems. It is hardly necessary to urge that all such trees be well planted, because the ultimate success depends so directly upon how they are planted and what kind of trees are selected. It is far better to plant half as many trees well than to plant a large number poorly.

Any city which starts upon a systematic plan of street planting can, with a limited expenditure, complete its program within a few years; and before the people are able fully to realize it, a veritable transformation will have taken place. Not only will such a procedure add to the material advantages and the commercial advancement of such a town, but the people within its borders will find a new pleasure in their daily living and a more active pride in their community. It will reflect itself almost everywhere, not only in the town as a whole, but in the greater care that is shown around many of the individual homes.

—From a radio address through Station WEAF, New York, to 19 stations of the Red Network of the N.B.C., as a part of the fiftieth anniversary celebration of the creation of tree surgery by John Davey, father of the speaker.

Uniting Beauty and Safety in a City's Streets

By E. A. LAWVER
City Engineer, Fort Collins, Colo.

A STONE GATEWAY
At the entrance of one of the Fort Collins parks

CAN beauty and safety be combined in a city's streets? Fort Collins has attempted to answer this question in the affirmative. It is difficult to believe that the men who laid out the streets of Fort Collins did not in some vague way envision the modern traffic problem. At least they planned broad streets and avenues. Possibly they had an eye for beautiful streets rather than for a traffic problem when they did so.

In these days of the ubiquitous automobile, it is hard to get beauty without sacrificing visibility to some extent, plan as carefully as one can. It is the writer's opinion, however, that beauty should not be sacrificed too ruthlessly in order to give motor-vehicle drivers unobstructed vision in all directions. There are values other than speed of travel which must be preserved if our cities are to remain or become desirable places in which to live.

A TRAFFIC HAZARD
This is the same gateway shown above as seen from inside the park. The "slow" sign is in recognition of the fact that the danger of collision exists

Complaints when shrubs and trees begin to obstruct vision are often due to the fact that landscape architects do not take into consideration the growth of plants. They wish to make an impression in the first year or two and as a result often overload the property landscaped. The public is often to blame for this, not being satisfied with skimpy-looking landscaping for a few years and feeling that the landscape architect has not earned his money.

Gateways and Traffic Safety

Gateways as well as growing vegetation bring up the question of traffic safety. Gates always create more or less of a hazard, but they may be justified by their beauty and by the fact that the driver and not the gate should be held accountable for accidents.

STREET PLANTING
that obstructs the view of oncoming cars

One of Fort Collins' park gateways (that shown in the first picture) is much admired, but that it does offer some traffic hazard is officially acknowledged by the "slow" sign appearing at the right in the second picture, which presents the same gateway from inside the park. In this particular instance the shrubbery growing above the stonework is more of a hazard than the gate itself, since without the shrubbery the driver of a car could see an approaching car over the top of the rock wall. And there is no danger of accident in any case at this point if cars are under control and are not greatly exceeding the city speed limit.

Through Streets with Center Park Strips

Fort Collins has two broad streets with center park strips, College Avenue running north and south and pass-

Photographs from Eugene A. Hancock

STREET FLOWER BEDS
These have replaced the shrubs formerly used as planting

"HIGH VISIBILITY" SPRINKLING

Approaching automobiles can be seen through the mist

ing the Colorado Agricultural College, and Mountain Avenue, running east and west. They are both designated as through streets and are 140 feet wide between property lines, with a 30-foot center park strip, except in the downtown section, and a 30-foot paved runway for traffic on either side of the center strip. The setback of houses is 25 feet, so that there is a space of 190 feet between building lines.

Drivers have no legitimate complaint in such a street as this, even if shrubbery does somewhat obstruct the view across corners. They do not complain in downtown streets where buildings are solid against sidewalk lines—and in many cities streets are much narrower than those in Fort Collins.

Some citizens do object, however, to shrubbery such as that shown in the third view. The driver of a car going west on this street (the camera was facing west) and making a left turn to cross the traffic lane down which the car in the picture is coming, cannot at any point, up to the time he turns, see cars coming down that traffic lane until they clear the shrubbery. Had he been crossing Mountain Avenue, approaching on the cross street without a turn, at the point shown in this picture, he could see cars approaching the intersection before they reached the bushy head of the block of parking.

The end of the park strip in this particular spot is 50 feet back of the curb line of the cross street, the light and trolley pole in the foreground being back of this cross-street curb line. There is no probability of accident here if cars are under control and within the speed limit. Reckless driving at this point, however, might cause a collision. It should be borne in mind, however, that visibility alone doesn't prevent accidents; careful driving is the only preventive under all circumstances.

Increased Visibility and Better Sprinkling

The city has given ear to popular demand for more visibility in a number of instances, especially at the ends of park strips, and in picture No. 4 is shown an intersection on Mountain Avenue where shrubbery gave place to flower-beds over which approaching cars can be seen.

In picture No. 5 is shown something else—a sprinkler system in operation. This does not offer a real traffic danger, for cars can be seen coming down the opposite traffic lane through the mist from the sprays. It happens that as a matter of economy and more efficient sprinkling this type of sprinkler is giving way in Fort Collins to a new system which might be considered even less of a traffic hazard. Where new installations are made, more and smaller sprinklers are being used which require smaller pipes and less water to accomplish the same result, and do not throw so much water onto the paving. Their spray is low and very little water is thrown above the line of vision.

In planting flowers in place of shrubs at the ends of the park strip, an effort is made to select flowers that carry out the shrubbery bank effect and fit in with the general landscaping of the block. Each block is handled as a unit.

Providing beauty and safety at the same time has been, for Fort Collins, a matter of compromise, with safety winning the argument wherever shrubbery or trees may be considered a real traffic hazard, and with flowers and lawns taking the place of shrubs and trees.

Higher Census Count Denied to Atlanta

IN its suit to compel Director William M. Steuart of the Bureau of the Census to list its population at 360,691 instead of 270,366, the city of Atlanta, Ga., received a second setback March 2, in a decision of the Court of Appeals of the District of Columbia, reported in the *United States Daily* on March 3.

The Legislature of Georgia had in 1929 created a new municipality of Atlanta, taking in five cities surrounding Atlanta proper and considerable unincorporated territory as well. The new municipality, however, did not have the usual powers of a city, as the component cities or boroughs remained practically the same as before. A council was set up, advisory in nature; and a charter is to be prepared, but is not to be acted on for ten years.

As stated in THE AMERICAN CITY for December, 1930, at page 158, the city brought suit in the Supreme Court of the District of Columbia, which ruled against it, but apparently on the grounds that the Federal Census Law did not expressly provide for the census of cities and that the Director could therefore not be ordered to use any specific figures for a given city. The Court of Appeals, however, stated that "it was manifestly the legislative intent that the census should include a separate enumeration of the population of cities."

The Court recognized, as the lower court had done, that the number, nature and duration of the powers conferred upon municipal corporations and the territory over which they shall be exercised "rests in the absolute discretion of the state," but "the Director of the Census is necessarily invested with discretion in matters of form and procedure when these are not specifically provided for by law, and the exercise of this authority cannot be controlled by the state legislature.

As to the enlarged municipality, the Court said: "The powers granted to the new city of Atlanta itself were meager, almost negligible, nearly all the governmental powers being vested in the various boroughs." The action of the Director in listing the population of the old Atlanta and giving the population of the enlarged municipality merely in a footnote was held to be within his discretion and not arbitrary or capricious.

Street Cleaning and Dust Laying in Spokane

By MAYOR LEONARD FUNK
Commissioner of Public Works,
Spokane, Wash.

A SCANT quarter of a century has brought about many changes in street cleaning methods, due primarily to the passing of the horse from metropolitan thoroughfares to make way for millions of motor-driven vehicles. Cobblestone paving of thirty or forty years ago has been displaced by hard, smooth-surfaced streets. This change has extended into residential districts, into suburban centers, and on into the country and across the continent.

Every city with more than a few thousand population has its street cleaning problems. Each vies with its neighboring city to keep its thoroughfares cleaner. In Spokane

THE METHOD OF CLEANING CATCH-BASINS BY MACHINE IN SPOKANE

we have 587 miles of streets, of which 104 are paved. With us, as in other cities, motor traffic, especially cars parked at curb lines, slow up the job of cleaning.

The "White Wing" Still a Necessity

With old Dobbin out of the picture, it would seem that we could do away with our white wings squad of horse-drawn vehicle days. Instead of eliminating these workers in our city, however, we have retained eighteen of them to work in the central business district. A dozen others work in the residential districts. Strange to relate, these white wings sweep up and remove from the streets more trash and rubbish of various sorts than in the pre-motor-vehicle days.

In the central and other business districts the men with brooms, shovels and pushcarts clear the streets and crosswalks of litter, spread sand and salt on icy surfaces during the winter, and report locations of clogged catch-basins in the sewer and drainage system.

Night Cleaning and Flushing

Our night cleaning operations begin after theaters and other places of amusement have closed, when traffic is at ebb, and there are few cars parked. We employ a crew of forty men, using three White and one General Motors flusher, four Elgin sweepers, and an Auto Eductor to clean catch-basins. We average 18 miles a night. All paved thoroughfares are cleaned at least twice a week, oftener if necessary.

Streets with steep grades are a problem in this inter-mountain region. We have solved this by using flushers to throw water into the gutters on either side and sweeping the street with hand brooms. It is slower, but is efficient under difficult conditions.

The total cost of street cleaning in Spokane for 1930 was $76,790, a monthly average of approximately $6,300. The daily average of litter and waste removed is 50 loads, which includes snow, leaves and other materials.

The Traffic Problem

I have been asked, "Is traffic a problem in street cleaning?" My reply is that it is a huge problem, not only in Spokane but in any city where effort is made to keep the streets clean.

With a population of 126,000, we have more than 38,000 automobiles owned and operated by residents of our city. Often I have tried to figure out what would happen if the owners of all these cars decided on the moment to visit what we might term our "loop" district—the main business section. It just cannot be done. Allowing 15 feet parking space for each car, it would require 114 miles of curb line, or half that number of miles of street. Let the readers figure out the rest of it. For my part I almost agree with our traffic squad, that more than half the automobile owners daily try to find parking space in our "loop" district—and for a city of our population we have

A MECHANICAL LOADER SPEEDS SNOW REMOVAL IN SPOKANE, WASH.

an unusually large central business district—with a resultant use of our thoroughfares as free municipal garages.

Spokane's streets are much wider than those of eastern cities, and wider than most other Pacific slope cities. But, at that, thousands of cars parked parallel to the curb add

to traffic congestion and to traffic hazards. Also they add, even late at night, to our street cleaning problems.

A recent survey made by Harry Aumack, advisory engineer of our City Plan Commission, showed that in our central retail district we have approximately 30,000 feet of curb line. Eliminating service station and other private driveways, reserved and fire hydrant space, there is room for 997 cars to park in zones ranging from fifteen minutes to one hour duration. Two public garages of ordinary capacity and a couple of vacant lots outside the congested district could care for all of these. But the owners prefer to take a chance and use the streets for parking. Result—hundreds of them pay overtime parking fines in police court, or forfeit their bail—usually $3, which would almost pay for a month's parking privilege in a public garage.

Hundreds of cars are parked all night near night clubs or hotels. When the street cleaning crew comes along, these cars must be moved. Sometimes the cars are locked. It delays the cleaning process and adds to the expense.

Winter Problems

In frosty weather our hillside paved streets are at times covered with a film of ice, or tightly packed snow. To protect the motorist so far as possible, our street department sprays sand on these, and also at intersections in level districts. When a thaw comes, this sand must be removed—another item in general expense. But it is a safety measure and, as such, is surely worth while.

Our snowfall is not great, but an occasional winter storm brings enough of the "beautiful" to hamper traffic. Formerly, snow was removed by hand from busy intersections of the downtown district. About two years ago, we purchased a snow loader, and a crew of four men operating this machine are able to load a truck of seven cubic yards capacity in about one minute. A fleet of twenty or more trucks is kept busy hauling the snow to the river for dumping.

During last winter our lowest temperature was 12 degress above zero. Following are comparative figures on snow removal for the last four winters:

Truck-loads of snow picked up: season of 1930-31, 1,401; season of 1929-30, 1,870; season of 1928-29, 9,572; season of 1927-28, 9,505. During the 1930 season 206 loads of sand were hauled to slippery streets; 3,613 loads of waste from the streets were hauled to the dumps, and besides, 274 loads of leaves were dumped; 3,984 loads of crushed rock were used to re-surface and repair unpaved streets.

The report of the Superintendent of Streets also shows that 89,857 city blocks were cleaned with flushers and sweepers, while 21,198 blocks were re-graded and put in shape for speedier traffic.

Street Sprinkling in Summer

In this region our summers are dry. So, beginning about the middle of April, we use street sprinklers to lay the dust on unpaved streets. Last year our sprinkling season continued to the middle of October. During that period our trucks sprinkled a total of 460,974 blocks, or an equivalent of approximately 88,721 miles. Even the most conservative reader must admit this is quite a distance.

The use of street sprinklers to lay dust gives but a small measure of satisfaction and amounts to nothing more or less than a waste of time and money. For a number of years we have been doing some oiling, which has proved far more satisfactory than spraying water. During the past year, we have tried a penetration method which gives promise of being decidedly more satisfactory than lighter oils or water. However, there is no substitute for pavement as a means of securing dustless streets.

Low Street-Car Fares for School Children of the District of Columbia

By **REXFORD L. HOLMES**

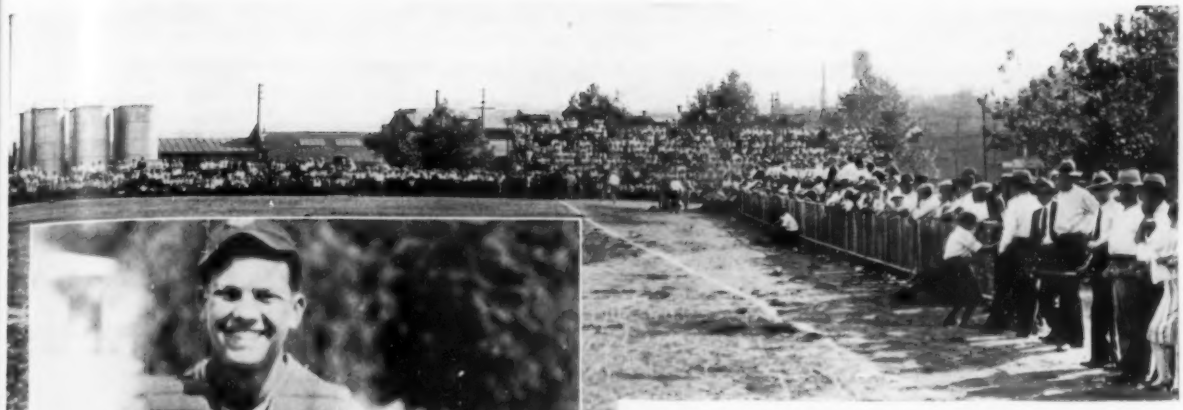
SCHOOL children of the District of Columbia under the age of 18 years are enjoying the results of an act of Congress, passed during the closing days of the last session, permitting the youngsters to ride on public street cars for 3 cents instead of the adult cash fare of 10 cents or 7½ cents where tokens are purchased.

Books or strips of tickets are issued to the children, the tickets for day school pupils being good between 7:30 a.m. and 5 p.m., and those for night students good from 6 p.m. to 10 p.m. Tickets are not accepted on Saturdays, Sundays or holidays. The traction companies of the District of Columbia have a list of pupils eligible for the reduced fare in each school. Strips of tickets are sold at the rate of 10 for 30 cents, or in books of 40 for $1.20. Transfers are issued to cross-lines and busses, without cost.

For a time teachers were required to sign the pupils' ticket books, but this requirement imposed so much added and apparently useless effort upon the already busy teaching force that the teacher's signatures were discontinued.

In a protest questioning the validity of the 3-cent carfare law, filed with the Public Utilities Commission, two of the local traction companies pointed out that their revenues will be sharply decreased by the operation of the new law. No specific rise in adult rates was requested, the petition merely asking the Commission to determine the fares for adults.

It was roughly estimated that the losses which would result from the lower school fares for the three District companies would approximate $200,000. The Public Utilities Commission has indicated that it will require an actual showing of loss resulting to Washington traction companies before considering an advance in adult fares. A survey indicates there are 52,577 pupils in the elementary and vocational schools, of which number only 13,052, or 2.57 per cent, use transportation to and from school. In the high schools, however, the comparative number of school riders is greater, a rough estimate placing it at about 70 per cent. This survey indicates a rather light usage of tickets by pupils, and the loss consequently to traction companies resulting from the 3-cent fare may prove not really burdensome. On one day, however, sales of tickets amounted to $17,024.40. The tickets are on sale at 33 agencies throughout the city. Other stations will be added as conditions warrant.



Typical crowd of 5,000 at a Cincinnati municipal ball game

THE SMILE THAT WINS

For two years this animated youngster, brother of Catcher Dickey, of the New York Yankees, has played on the Junior Baseball Championship team of Arkansas. The American Legion's Junior Baseball is one of the fine activities of the National Americanism Commission

For More and Better Municipal Baseball

By **C. O. BROWN**

Secretary, Municipal Baseball Association, City Hall, Cincinnati, Ohio

BASEBALL, like other branches of athletics, has lent itself to organization, usually by interested groups or individuals. As interest in the game grows in a community, problems of finance, maintenance, allotment of grounds, administration and organization, show a corresponding growth to a stage where almost inevitably one of two things happens. With the first, which is incorporation, in most cases with paid players, we are not at present concerned. The second is coordination with the municipal recreation or park department. There has been a strong recent swing of opinion to this type of administration for sports, where otherwise the opportunities for patronage and "favors" are great. Public support and public control have proved the greatest guarantee to complete and satisfactory expansion.

The Municipal Baseball Association of the United States was formed in April, 1930, for furthering such coordination. Its officers are recreation executives or members of recreation advisory boards, all serving without pay. Its membership is limited to amateur baseball associations operated by proper municipal recreation authorities, or, in the absence of such association, to bodies of amateurs officially designated by municipal recreation officials. During its first year the Association devoted much of its effort to studies of the influences that are proving detrimental to the game and how these may be offset.

In Small Communities

One of the most familiar difficulties encountered in small communities is the apparent paradox of insufficient and inadequate fields. Twenty years ago any fairly level field was considered suitable for baseball. Improved methods of transportation and communication, education through motion pictures and well-illustrated sports pages, have led youngsters today to demand something at least resembling a professional park on which to stage their contests. Absence of recreation officials and a planned recreation program in many places preclude this possibility. Many small communities have one excellent park *within the bounds of which young teams are forbidden to play!* Inadequate recreation planning, of which this is an example, is the worst menace to the healthy development of amateur baseball.

Another major menace to the game's popularity is the distraction of other interests. Maintenance of a fair tennis court is cheaper than that of a good baseball diamond. Nearly every small community now has public tennis

courts, and a golf course as well, and commercial entertainments are never wanting. On the other hand, every "kid" team now wants to be uniformed, and expects equipment similar to that of the local professional stars, and serious problems of finance arise in consequence. The day of the community as a social unit is disappearing, and with it the natural rivalry in the formation of neighborhood teams. Unless the community boasts an individual who realizes the value of team sports for young boys, gives his time to organization, and preaches "the game" with the zeal of an evangelistic leader, baseball languishes.

Over-zealous inter-community competition, also, has proved injurious to the best interests of amateur baseball. Inter-community rivalry is an excellent stimulus to the game, but the value of baseball as recreation is defeated by the "beat Smithville" spirit. When such a spirit prevails, professional or "semi-professional" players are imported, to the utter discouragement of the aspiring Babe Ruths and Lefty Groves of the community. Such a situation was effectively met in a suburban league in Ohio by the adoption of a rule requiring all players on any team to live within a fixed radius of the represented towns' corporate limits.

In Large Cities

The urban situation is more heartening, as was recently shown when nine cities cooperated in gathering information bearing on amateur baseball problems. These were New Haven, Conn.; Reading, Pa.; Minneapolis, Minn.; Indianapolis, Ind.; Canton, Columbus and Cincinnati, Ohio; Louisville, Ky.; and St. Louis, Mo., the last five being charter member cities of the Association.

SMALL BOYS ALSO PLAY BALL!
This safety poster distributed by the American Automobile Association is another reminder of the Recreation Department's responsibility for play fields

Financing, always a matter of importance, was shown to be managed by different methods in different cities:

St. Louis permits, by city ordinance, the collection of funds on municipal fields three days during the year for financing an association under direction and supervision of the municipal recreation division of the Park Board. Louisville finances its association activities by playing a few of its final championship games at the American Association baseball park, for small admission charges.

Cincinnati annually sponsors an "Amateur Day" when the public is solicited on a large scale to buy tickets for an all-star program made possible by free use of the National League park in that city. The Ohio River further collects a nominal fee for grandstand and bleacher seats on certain fields at league games, and through the city treasury disburses funds so derived to provide umpires and some of the baseballs used.

New Haven bears a major portion of umpiring expenses, a rapidly increasing item, from the city recreational budget. Reading's Recreation Department provides officials for junior activities.

Cleveland sponsors a "Huck Finn" league for juniors, in which the essential equipment for a game is provided under supervision of a city employee who also acts as the official. At the end of the game the equipment is collected and used by the next pair of teams assigned to the grounds. Other cities have various combinations of these ideas, all workable, to aid teams.

Methods of organization show similar elements in many cities. St. Louis sets up a governing board consisting of one member elected from each league of the association. This is general practice among the charter members of the M.B.A. Louisville and Cincinnati, however, have a second board appointed by municipal authorities, which has further duties and powers, the general function of the elective body being to interpret the needs and wishes of the teams, the second to coordinate with legal phases of municipal administration and to interpret the policy to the general public. Detroit depends primarily on the second group for successful operation of its association.

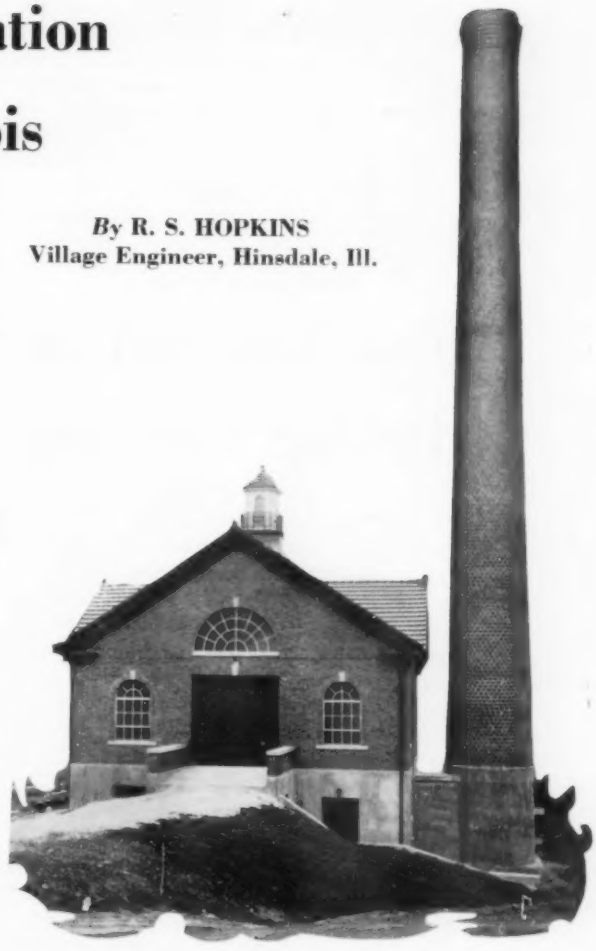
A National Service

The Municipal Baseball Association is concerned with all such problems in detail while also acting as a national clearing-house for district associations. Within districts, the first of which has already been established, there will be inter-city tournaments for sectional championships. The Association aims also as a permanent policy to encourage cordial relations between neighboring cities, to place all amateur baseball so far as possible in the hands of responsible parties with proper background by training and experience, to place emphasis upon increased even competition within cities rather than upon development of one or a few outstanding teams for inter-city games, to set up and popularize higher standards of sportsmanship and competition, to provide a recognized body to which cities may come for baseball information, and to conduct at least two meetings annually for the exchange of ideas. A monthly service bulletin has been established to these ends.

The services of the Association are at the disposal of any interested group or individual without cost for three months. Inquiries regarding this service or directed toward membership in the Association should be addressed to the author.

Disposal by Incineration in Hinsdale, Illinois

By **R. S. HOPKINS**
Village Engineer, Hinsdale, Ill.



HINSDALE is a village of 7,000 people, comfortably situated in a highly restricted residential community seventeen miles west of Chicago on the Burlington Railroad. The village occupies an area of about four square miles with well-paved streets and very few alleys. Zoning ordinances discourage the erection of apartments and large commercial or industrial buildings, thus preserving the residential desirability of the community. A substantial portion of its citizens are Chicago business people.

The village owns and operates its municipal utilities, including an electric light and power plant, water-pumping and water-softening plants, ice machinery and refuse disposal. The utilities are operated efficiently at a net profit.

The First Incinerator

In 1913, the village installed a small single-unit incinerator of the Lewis & Kitchen design, connecting the plant to the chimney of the utilities power plant. This plant having become obsolete and inadequate to meet the tonnage requirements of the village for its waste disposal, and also having reached an age where maintenance was becoming excessive, it was deemed necessary to build a new and modern incinerator plant.

An exhaustive study was made of incinerators in other communities of comparable size, to determine modern capacity requirements and operating characteristics, and also to ascertain and profit by the experience of other cities and villages in their garbage disposal solutions. The several reports received were given careful analysis, after which specifications were prepared by the Village Engineer, on which proposals were invited. Bids for the new plant were accordingly advertised for, to include the complete incinerator except approach ramps, which the village constructed with its own forces. Inasmuch as the population of the village had increased from about 4,000 in 1920 to about 7,000 in 1930, a capacity equivalent to 10 tons in 8 hours was called for. The building was required to harmonize in architectural detail with the water-softening plant.

Bids for the new plant were taken on August 19, 1930, five proposals being received ranging from $27,000 to $46,800. Two of the companies bidding on the work had had no previous municipal experience and were not given serious consideration, leaving three established firms as active competitors for the work.

A carefully detailed analysis of these several proposals was made which revealed the fact that the bid of the Jones Incinerator Co. was the only one to include a two-unit incinerator. This fact, together with a number of other features included in the Jones bid which were not incorporated in the bids of the other companies, resulted in the award of the contract to the Jones Incinerator Co., of St. Louis, at its price of $33,703.

Work was begun on the new incinerator on September 20, 1930, and garbage was first burned in the incinerator on January 5, 1931. The plant was then operated by the village for a period of thirty days and the acceptance test was conducted on February 9, 1931. All operating guarantees specified were met with an ample margin of safety.

The New Incinerator

The new incinerator is housed in an attractive building of fireproof construction. The substructure of the building up to the charging floor is of concrete, the superstructure being of a hard-burned face brick trimmed with Indiana cut stone. The roof of the plant is of Ludowici tile laid upon a deck of solid U. S. gypsum blocks, supported by steel trusses and purlins. Copper cornices with ornamental dentils add to the attractiveness of the plant, and the roof is topped by a cupola of copper and sheet metal construction. The entire interior of the building is lined with a golden-tint salt-glazed brick. The chimney, which is 100 feet in height, is constructed of red radial brick and lined with a sectional firebrick lining supported at four points on corbels built on the inside of the radial brick shell. The subcontract for the chimney was given to the Alphons Custodis Chimney Construction Co.

The battery of two furnaces is constructed of firebrick, insulating brick, and cast iron parts encased in a ¼-inch steel plate, rigidly fabricated. Each of the two units is arranged for individual dampered control and is connected to the chimney through a large combustion chamber.

Each of the furnaces has an inside area of 85 square feet, an inside volume of 416 cubic feet, and a grate area of 40 square feet. A heating coil is installed in the breeching between the furnaces and chimney to generate hot water for washing the plant and for the convenience of employees. The necessary toilet facilities are provided, as is also a forced-draft blower driven by a small variable-speed motor.

An average of about 7 tons of refuse is collected and burned daily, only one unit of the plant being used at one time. The operation is entirely odorless and practically smokeless and is considered a valuable civic asset.

While accurate records are not yet available, the indicated cost of disposal at the plant is nominal.

At present the village is collecting refuse by teams and wagons, a method which has been used for many years past. In the near future the collecting equipment will be motorized.

Valves Inserted in 20-Inch Water Main at Bridge Crossing

By **J. GIL. DAVIS**
Commissioner,
Department of Public Property,
Newport, Ky.

IN Newport, Ky., a 20-inch cast iron bell-and-spigot water line, one of the main supplies from the reservoir to the city, is carried over the C. & O. Railway tracks over a traffic bridge with a street-car line on one side of the pipe and vehicular traffic on the other, with the main exposed in the center. This line was laid about 45 years ago, in the days of the horse and wagon. Present-day traffic with automobiles and heavy trucks causes the bridge to vibrate, so that there has been trouble during the past few years because of leaky joints.

There were no valves in the pipe that would have permitted shutting off the water in case of damage to this section of pipe, and traffic was increasing daily over the bridge supporting the pipe. Improvements were necessary in water mains and street extensions in the territory adjacent to this installation, so that it was thought advisable to insert valves on the line on either side of the bridge structure. To do this and not cut off the city water supply was the problem.

A Smith valve-inserting machine, rented from the A. P. Smith Manufacturing Co., of East Orange, N. J., was placed on the main at the point where the valve was to be inserted. The pipe was then cut about half-way through and a special sleeve bolted around it, the end of the sleeve being placed within ¼-inch of the cutting tool. The valve-inserting machine was then bolted around the pipe and the sleeve, completely enclosing the cutting mechanism. The joints between the pipe and the machine casing were leaded and calked, and the pinion shaft was rotated until the pipe was cut through. The cutting machine with the 12-inch section of pipe was then drawn up into the dome of the inserting machine by means of a central rod. A sliding valve was closed, making a separate compartment of the dome, which was then removed. The cutting machine with the section of pipe was removed from the dome, the special valve substituted for it and the dome replaced on the main.

The sliding valve was reopened and the special 20-inch valve was lowered into place between the ends of the pipes. The special sleeve was forced forward by means of jacks until it entered the large hub of the special valve and the opposite or small hub of the valve was forced onto the pipe. Both hubs are provided with wedge-shaped lugs which center the pipe and sleeve ends and hold in place the rubber gaskets which form the temporary joint between the gaskets and the valve. The upper casing was then removed and the joints at both ends of the valve and the sleeve joint were leaded and calked.

The work was all done without any interruption to the flow of the water, taking about two days for the insertion of each valve.

INSTALLING ONE OF THE 20-INCH VALVES
at Newport, Ky., under pressure without disturbing the flow of the water

Asphalt Construction and Treatment for Airport Surfaces

By ARTHUR H. BLANCHARD
Consulting Highway Engineer
and Consultant on Airport Surfaces
and Highway Traffic Control

TO those familiar with the efficient construction of asphalt surfaces on crushed stone, crushed slag and gravel roads, and all asphaltic macadam and asphaltic concrete pavements, it is self-evident that these types of asphalt construction and treatment readily meet all the basic requiments of the Aeronautics Branch of the U. S. Department of Commerce pertaining to the surfaces of landing areas and runways.

The experienced constructor of asphaltic surfaces and pavements is well aware that it is a matter of simple routine to build such surfaces and pavements with an efficient texture which renders them non-skid for airplane traffic.

Furthermore, to those versed in the well-established characteristics of asphaltic surfaces and pavements, it is recognized that they meet such desiderata as reasonable first cost; roadway surfaces which readily distribute superimposed loads to the foundation courses; surfaces having the requisite smoothness; essential resilience, a characteristic equally important from the standpoint of economic upkeep of airplanes as of motor vehicles on highways; waterproof and dustless surfaces; excellent visibility, the contrast being well-defined with adjacent surfaces of turf, earth, sand or gravel; and, when maintenance is necessary, surfaces which may easily, quickly and economically be repaired without interfering with the use of runways or landing fields.

It is also apparent to those familiar with the load capacity of the several asphaltic treatments and asphaltic pavements mentioned that they will efficiently carry any airplane loads to which they may be subjected, and furthermore, from the standpoint of impact and traction forces, that the cost of maintenance will be negligible providing that the Secretary of Commerce issues regulations pertaining to certain details of construction of airplanes, hereinafter to be mentioned, which will permit economical and efficient construction and maintenance of airport runways and landing fields.

What is the fundamental principle underlying the suggested regulations mentioned in the preceding paragraph? What is the chief obstacle to economic design, construction and maintenance of surfaces of landing fields and runways? The answer is apparent to experienced highway engineers who have diagnosed the characteristics of airplane design and the effects of airplane traffic on airport surfaces. Judging from the slow improvement in airplane design, from the point of view under consideration, and the lack of coordinated agitation upon the part of airport owners, it seems apparent that the manufacturers and owners do not realize the necessity of a modification in the design of airplanes.

What causes the maximum damage to the surfaces of landing fields and runways? The answer falls into a category which it is believed is not debatable. Reference is made to the general use of tail struts equipped with metal shoes.

What is the current status of the use of these uneconomical tail devices? The results of an investigation made by the writer in December, 1930, of airplanes at the airport of the Mid-Southern Airways at Memphis will give a bird's-eye view of typical current conditions. From a general standpoint, it was found that 75 per cent of the 45 airplanes at this airport had tail struts and metal shoes, or, in other words, that only eleven were equipped with

Airport Runways

"Runways shall be constructed of crushed stone, crushed slag, or other wear-resisting compound material, used in conjunction with a suitable binder, in such a manner as to give a smooth, firm, uniform surface. (This includes such types of construction as bituminous macadam, bituminous concrete, portland cement concrete, etc.) Runways shall be so designed and constructed as to withstand safely the loads to which they will ordinarily be subjected. They shall permit safe landing and taking-off of airplanes under all weather conditions and shall be not less than 100 feet in width. The distance from the center of any runway to the nearest paralleling edge of the landing area shall be at least 200 feet. The runways may be given a slight crown, either positive or negative, as may be desired to facilitate drainage. (It is recommended that the crown shall not exceed 6 inches per 100 feet of width. Generally 3 or 4 inches per 100 feet of width will suffice.) The edges of the runways shall be flush with the adjacent surfaces of the field, and either transition strips of some granular material, such as crushed stone or crushed slag, used in conjunction with a proper binder, or other suitable means, shall be provided to insure the safe landing and taxiing of planes across the runways in any direction."

—Definition by Aeronautics Branch, U. S. Department of Commerce.

tail wheels. Let us glance for a moment at the details of the investigation pertaining to tail struts. One airplane had a ¾-inch-wide metal shoe; 9 had 1-inch shoes; four, 1½-inch shoes; eight, 2-inch shoes; two, 2½-inch shoes; one 3-inch shoes; and nine, 4-inch shoes. A doubting Thomas might say that all the heavy planes were equipped with tail wheels. To the unprejudiced investigator, it would be at once apparent that anyone claiming that such a relationship existed had never conducted a thorough examination of a large group of airplanes at any given airport. For example, the heaviest airplane found at the Memphis airport was a U. S. Army plane equipped with a tail strut having a metal shoe ¾-inch in width.

With approximately 75 per cent of the airplanes coming to rest on landing areas or strips and taxiing on runways, equipped with, camparatively speaking, knife-edge metal shoes, is it remarkable that landing areas and strips are covered with long, deep gashes and that runway surfaces are subjected to a terrific punishment?

Many aviators who have been consulted are a unit in agreeing with the fundamental principles underlying the regulations proposed that on and after a certain date all airplanes shall be constructed with tail wheels and suitable brakes.

The promulgation of this regulation will mean, at present, the saving of hundreds of thousands of dollars annually and, with the rapid development of the construction of airports throughout the United States, the saving each year will run into millions of dollars.

Wisconsin Develops a Citizens' Approach to Its Problems

By **AUBREY W. WILLIAMS**
Secretary, Wisconsin Conference of Social Work

EVERYWHERE, citizens are admonished to inform themselves about the affairs of their government, their schools. They do not know their towns. They know next to nothing that is accurate about the fiscal affairs of their county, city, or any other subdivisions of government. One very large reason is that there is no way they can, within the limits of their time, learn anything that is worth knowing about these matters. The citizen has had no way of comparing, for example, that which has been given to his children in the way of training with that which has been given to children by and large the country over. The same thing may be said with respect to the whole field of community health, city planning, and municipal government, as well as the activities that fall into the fields of social work, recreation, and library service.

The problem of informing citizens and providing them with a basis of comparison is a subtle and difficult one. In Wisconsin, we have been attempting, however, to do this very thing. During the past year, citizens in some 51 cities, villages, and towns in Wisconsin, conducted self-examinations of their schools, government, health work, recreation, employment, etc. These ranged from villages with a population of 300 to metropolitan centers with a population of more than 500,000, including:

Appleton	Elkhorn	Plymouth	Frederic
Janesville	Glenwood	Rice Lake	Grantsburg
Kenosha	Horicon	Ripon	Independence
La Crosse	Kewaunee	Sheboygan Falls	Luxemburg
Madison	Kiel	Stoughton	Milton - Milton
Oshkosh	Ladysmith	Washburn	Junction
Racine	Lake Mills	Waupaca	Osceola
Sheboygan	Menasha	Alma Center	Shell Lake
Two Rivers	Menomonie	Bangor	Somerset
Alma	Mineral Point	Cottage Grove	Wabeno
Antigo	Oconto	East Troy	Walworth
Brodhead	Phillips	Footville	West Salem
Columbus	Platteville		

The full story of that survey will probably never be known. Here was a stock-taking by those that pay the bills; here was an effort that did not have as its aim organizing something to establish this or that in the town. Here was a fact-finding campaign just for the reason that those making it wanted to know what the facts were; and what the facts would lead them to undertake later on was another matter. They were out to find out how far there had been incorporated into their schools, government, health work, those ways of doing things which represented the most advanced and acceptable methods thus far worked-out and suggested by competent authorities.

Briefly, the job was undertaken jointly by the Wisconsin Department of the American Legion, furnishing the man-power, and the Wisconsin Conference of Social Work, furnishing the technique. They had the cooperation of the University Extension Division through its Bureau of Municipal Information and its large field staff, the Wisconsin Industrial Commission, the State Board of Health, the Wisconsin Free Library Commission, the State Department of Public Instruction, the State Board of Education, and the Departments of Sociology, Engineering, and Agriculture of the University of Wisconsin as well as its School of Music and Department of Education.

The citizens made their studies by means of guide books divided into sections on Historical Background, City Planning, Municipal Government, Industry, Education, Recreation, Social Work, Town and Country Relations, Health, Library, and Religion. These large divisions of the "appraisal forms" were further divided into parts corresponding to the organization of such work in the communities. These were worked out under the direction of the Wisconsin Conference of Social Work, with the following men responsible for, or collaborating on, sections:

Prof. F. A. Aust, of the College of Agriculture, and Prof. H. F. Janda, of the College of Engineering of the University of Wisconsin—City Planning.

Ford H. MacGregor, Chief of the Bureau of Municipal Information of the University Extension Division—Municipal Government.

F. M. Wilcox, of the Wisconsin Industrial Commission—Industry.

Dr. C. A. Harper, Secretary of the Wisconsin State Board of Health—Health.

O. H. Plenzke and John Callahan, of the State Department of Public Instruction; G. P. Hambrecht and L. C. Greiber, of the State Board of Vocational Education; Prof. A. H. Edgerton, of the Vocational Guidance Department of the University of Wisconsin, and Prof. J. K. Hart, of the School of Education of the University of Wisconsin—Education.

C. B. Lester, Chief of the Wisconsin Free Library Commission—Library.

J. L. Gillin, of the Department of Sociology of the University of Wisconsin—Social Work.

E. B. Gordon, of the University of Wisconsin School of Music—Recreation.

J. H. Kolb, of the College of Agriculture of the University of Wisconsin—Town and Country Relations.

The American Legion, in undertaking the task, set up local committees for each one of the sections in the survey, including on these committees public officials, such as the mayor, city health officer, superintendent of schools, and other specialists or individuals especially interested in the things that were studied. This meant that approximately 2,500 citizens in the state were in some manner intimately engaged in making studies of local conditions in comparison with the standards laid down by those in a position to know.

New 20,000,000-Gallon-Daily Pumping Unit Replaces Old Pumping Engine at Cambridge, Mass., Water Works

Fresh Pond Pumping Station Modernized with Compact, Horizontal Compound Pumping Engine

REALIZING the need for more adequate pumping capacity, the Water Board of the city of Cambridge, Mass., decided to replace the old and famous Leavitt pumping engine at the Fresh Pond pumping station with a more compact unit. Long and continuous service had almost completely worn out the old engine. To insure the installation of modern and efficient pumping equipment and to determine the type best suited for the conditions of service, the Water Board engaged A. O. Doan, consulting engineer, Boston.

New Unit Installed

After a thorough study of the various types of pumping equipment available, it was decided to purchase a horizontal cross compound crank and flywheel condensing pumping engine. Bids were obtained from various pump manufacturers, and the contract was awarded to the Worthington Pump & Machinery Corporation for a 20,000,000-gallon unit, the installation of which was completed in September, 1930.

The new pump is a standard opposed type with double-acting steam cylinders at one end and double-acting pump cylinders at the opposite end of the engine frame. The steam cylinders, consisting of a 26-inch high-pressure and a 60-inch low-pressure unit with 42-inch stroke, are equipped with Corliss valves throughout. The pump plungers, which are 26½ inches in diameter, are the outside center-packed design. The inlet and exhaust valves of both the high-pressure and low-pressure steam cylinders are driven by separate eccentrics and wrist plates. This arrangement permits accurate timing of the valves, which is a contributing factor to the high economy obtained with this unit. Because of its size and length of stroke, the low-pressure cylinder is equipped with a tail rod. That is, the piston rod extends through both ends of the cylinder, each end of the piston rod being supported by a crosshead. With this arrangement the weight of the piston is carried almost entirely by the piston rod, thus relieving the cylinder of considerable pressure and consequent wear.

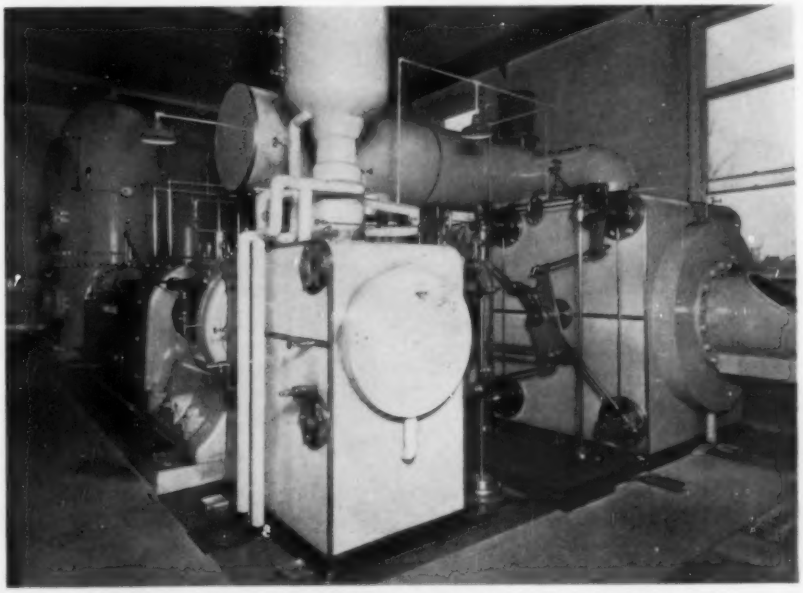
Auxiliary Equipment

Auxiliary equipment comprises a large-surface condenser of the conventional water-works type, an independent air pump for removing the condensate from the condenser, a large feed-water heater located in the exhaust line, an auxiliary feed-water heater, attached boiler feed pumps driven from the main crosshead, and, for condensate removal, a steam separator located adjacent to the high-pressure cylinder throttle valve. Equipped with all the necessary automatic safety devices, this engine, with its auxiliary apparatus, provides an efficient pumping unit embodying modern features of water-works practice.

Operating Economy

Erection of this unit was completed early in September, 1930, and the official duty test was run on September 10, 1930. The test lasted for nine hours, during which time careful checks were made of the economy of the unit, as well as its general operation in service. At the end of the trial it was found that it had shown good economy, exceeding its guarantee by a large amount.

Next to quality, economy of operation is the most important factor to consider in connection with this type of equipment. To give the fullest consideration to the factor of economy, the Water Board of the city of Cambridge required each bidder to guarantee the duty in million foot-pounds of work performed per 1,000 pounds of dry steam consumed by the unit. The manufacturer's guarantee for this engine was 144,000,000 foot-pounds of work per 1,000 pounds of dry steam. The contract called for a



THE NEW 20,000,000-GALLON PUMPING ENGINE AT THE FRESH POND STATION OF THE CAMBRIDGE, MASS., WATER WORKS

deduction of $900 to be made from the contract price for each million foot-pounds the engine fell short of the guaranteed duty. This amount was considered just compensation to the city for the loss which would thus be experienced.

The duty actually obtained on the official trial was 148.6 million foot-pounds per 1,000 pounds of dry steam. The excess of 4.6 million over the guarantee when evaluated at $900 per million represents a saving to the city of over $4,000.

A New Method of Raising Valve Boxes to Pavement Grades

By **E. T. CRANCH**
Manager, New Rochelle Water Co., New Rochelle, N. Y.

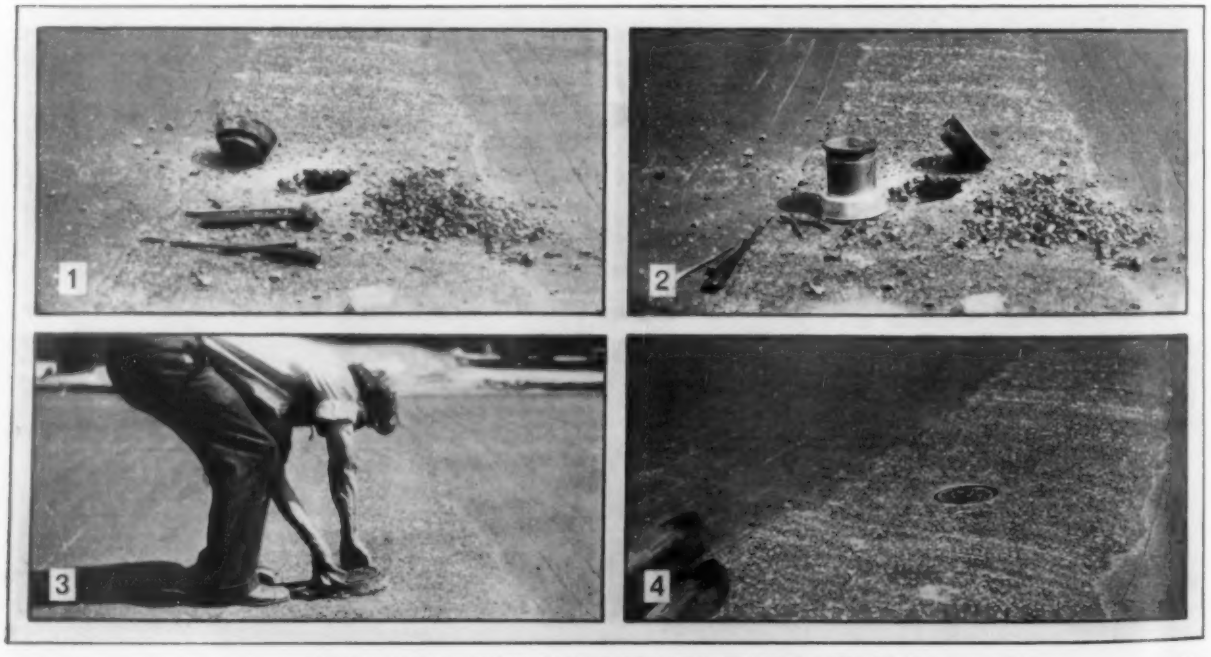
ABOUT twelve months ago, the New Rochelle Water Co., supplying a district in Westchester County which lies north of New York City, adopted a system of raising valve boxes to grade in paved streets, which has to date proved very satisfactory and economical. In this method an aluminum or sheet metal shell is used, the base of which fits into the upper half of the valve-box casting, and the top of which is made to hold the regular valve-box cover snugly.

The procedure is well illustrated in the accompanying photographs. Where a box has been covered with several inches of paving, the paving is first cut away and the cover of the box removed. Then, an adapter is inserted into the valve box, after a light piece of jute has been tied around the end of the adapter to prevent mortar from running down into the valve box. The adapter is rotated down into position with the mortar around it.

The mortar for this purpose is mixed with about one part of quick-setting cement to one part of sand and is moistened only enough to make it workable. On light-traveled streets no attempt is made to protect the box from traffic, but on the more heavily traveled streets, a flag is usually left over the box for 24 hours.

The entire installation takes about one-half hour's work for one man. In fact, some changes can be made in only fifteen minutes. The pavement is disturbed only enough to remove the cover from the box. Without going into any exact figures, it is obvious that this method is far more economical than the old one of cutting the paving, raising the top half of the box, backfilling, repaving, and trusting that the box will remain at its correct height.

During the last twelve months we have used over 100 of these Rite-Hite adapters, made by the Public Service Equipment Co., of New York, and expect to use several hundred more during the present year because of their economy and ease of installation.



REINSTALLING A VALVE BOX AT THE NEW GRADE OF THE ROAD

1. A box which has been covered with several inches of paving. The paving has been cut away and the cover removed. 2. The adapter ready to insert into the valve box. 3 Rotating the adapter downward into position with the mortar around it. 4. The completed job with the cover flush with the pavement

Lessons Learned at Fire Schools

IN half of the 48 states, short courses for firemen are under way or definitely planned for 1931. In eight others the organization of such schools is under serious consideration. The benefits of these courses and some of the lessons learned at them were outlined as follows in an address delivered before the spring meeting of the National Fire Waste Council of the Chamber of Commerce of the United States, at Washington, D. C., March 27, 1931, by Clarence Goldsmith, Assistant Chief Engineer, The National Board of Fire Underwriters, New York, Chicago, San Francisco.

The benefits to those who attend the schools are numerous and diversified. The maximum amount of information is obtained and retained by those in attendance in participating in the actual fire department maneuvers, customarily called "drills and training." This course of instruction includes the handling of equipment and apparatus ordinarily found in fire service and fairly well standardized throughout the country. At the schools which have been conducted by the larger cities much study has been given to the development of methods that will enable a fire company to perform a given evolution in the least time and with the least fatigue to the men. Such evolutions are taught in the school, with the result that, after instructions have been given, fire department members even in small towns and villags can raise and climb ladders and lay hose lines as rapidly as their brothers from the larger cities. It is not uncommon for a group of six men to reduce the time of performing any particular maneuver to one-third and sometimes one-fourth of that which they required prior to receiving instruction. Life-saving and resuscitation occupy important places in a modern fireman's duties. He is taught how to rescue unconscious persons from a burning building and how to revive them when brought to a place of safety. He becomes equally well versed in the methods of resuscitation of those who appear to have been drowned, persons overcome by noxious gases, and even the revivification of newly born babes.

Hydraulics and Chemistry of Fire Fighting

The subject of hydraulics of fire streams up to within the past decade was looked upon by the rank and file of fire departments as a highly technical subject, the theory of which could be understood and put into practice by only a few who had received advance technical education. Such is not the case today, as a large proportion of the memberships of large city departments can make calculations in connection with various combinations of hose, water pressures, and nozzles with unerring accuracy and in much shorter time than the technical engineer who has not specialized in this particular subject can make them. Hundreds of those who have attended the short courses are equally proficient. This knowledge enables any fire company to get into effective action immediately upon arrival at the fire grounds when the hose line has been laid, as the knowledge obtained eliminates the delays which formerly prevailed when the pipe men had to call for more pressure and were knocked off their feet when the pressure was too great. It also eliminates the possible confusion of orders which frequently occurred under the old methods of operation. Today a well-trained fire company goes into action quietly and with no confusion.

Of the subjects taught in the several schools, probably none has created more general interest and provoked more general and instructive discussion than that of the chemistry of fire. As is well appreciated by educators, lectures without illustrations or demonstrations are among the least effective methods of instruction. The subject of the chemistry of fire lends itself to many experiments which can be conducted during a lecture to illustrate the different principles involved.

A fireman in action must think along two lines simultaneously: the first is to safeguard his life and the lives of his co-workers; the second is to extinguish the fire. To do this work safely and intelligently, he must understand the dangerous features of gases and chemicals which he encounters, for a few breaths of some gases may overcome him and even snuff out his life; while, on the other hand, if he applies water ill-advisedly, his life may be menaced by an explosion.

Salvage Operations and Fire Prevention

Lectures and demonstrations dealing with salvage operations occupy very important places in the curriculum. Many authorities assert that one-half of our fire waste is due to damage by water and smoke. Much of this, irrespective of its actual amount, can be prevented by the intelligent use of salvage covers, proper ventilation, and prompt cleaning-up of water after the fire has been extinguished. Members in attendance at the schools are taught the application of covers for the proper protection of stocks warehoused in numerous different ways, the making of catchalls to hold water, and chutes to discharge water from buildings. They are instructed in the proper methods to use in ventilating so that the minimum damage may be done to the building.

Fire prevention has become one of the leading activities of all fire departments since the beginning of the present century. Methods of fire prevention bureau organization and the conducting of the actual work are discussed both in lectures and about the round table. This latter method of fixing the points in the minds of those in attendance has a marked superiority over the lecture method, and the interchange of ideas thus accomplished broadens the general knowledge.

It has been stated previously that firemen's short courses are primarily for the members of the small departments; the officials of the larger city departments, however, find that these schools serve as a great stimulus to the members of their own departments who attend the schools when they are held in their own city or in adjacent cities. Schools have been held in cities adjoining several states; and in one, the firemen from communities in outside states outnumbered those attending from the state in which the school was held.

Benefits Summarized

The fireman who has attended has become more proficient in his calling, and in doing this has raised the plane of his profession.

The schools have developed a demand for technical literature on fire department operation and fire control which is being made available by several different agencies. Those who have been connected with the staff of instruction, have, with the suggestions of those firemen who attended, developed new methods and procedures in the art.

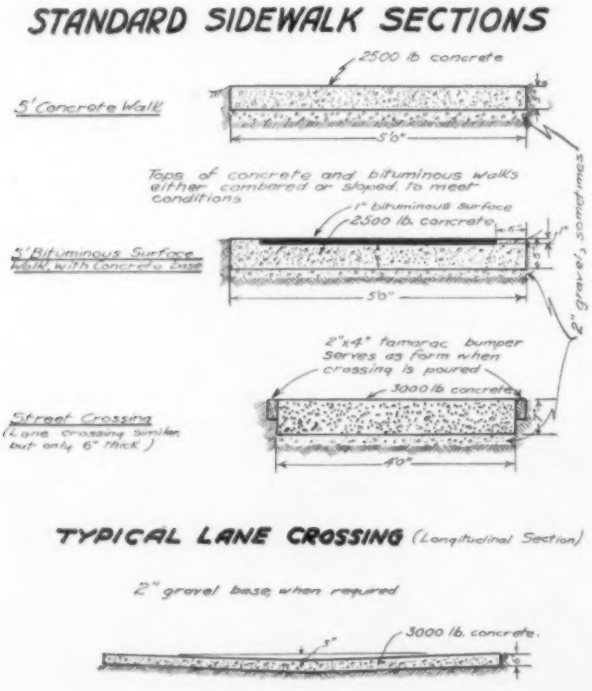
The schools, through the Fire Service Extension Committee of the National Fire Waste Council, state universities, municipal leagues, and other organizations, have convinced a large part of the public that the firemen, particularly the chief officers, are men whose opinions should be respected in regard to fire prevention matters.

Bituminous-Surfaced Concrete Sidewalks

By **A. W. HADDOW**
City Engineer, Edmonton, Alberta

A BITUMINOUS-SURFACED concrete walk which seems to meet with general public approval has been developed by the city of Edmonton, Alberta. The walk comprises a 4-inch base of 2,500-pound portland cement concrete surfaced with one inch of sheet asphalt mixture.

The grading work is done in the usual way with teams and hand labor by a grading gang using wagons and scrapers. The fine grading is done by hand labor by the concrete gang, and wooden forms are set to line and grade along the edge of the walk, with spacing bars at intervals of 25 feet to provide for expansion and contraction. The concrete is then poured, and the side and transverse surface retaining shoulders, 1 inch high, are immediately completed.


STANDARD SIDEWALK SECTIONS
2500 lb concrete
5' Concrete Walk
5'0"
Tops of concrete and bituminous walks either cambered or sloped to meet conditions
1" bituminous surface
2500 lb. concrete
5' Bituminous Surface Walk with Concrete Base
5'0"
2" gravel, sometimes
2"x4" tamarac bumper Serves as form when crossing is poured
3000 lb. concrete
Street Crossing (Lane crossing similar but only 6" thick)
10'0"
TYPICAL LANE CROSSING (Longitudinal Section)
2" gravel base when required
3000 lb. concrete.

The sheet asphalt surface is mixed at the city paving plant in batches containing 1,000 pounds of paving sand, 125 pounds of asphalt cement grade B with a penetration of 58-63, and 41 pounds of paving dust filler. This mixture is hauled to the job in trucks, spread in the usual way with hot rakes and consolidated with a 1,700-pound water-ballasted roller 30 inches in diameter and 30 inches wide. Either portland cement or paving plant dust is spread over the freshly consolidated surfacing.

The street gang, comprising a foreman and 20 men, complete an average of 1,500 to 1,800 lineal feet of surfacing per 8-hour day. The total cost of 1-inch surfacing per square yard is 66 cents. Very often the surfacing is not laid for several weeks after the base, but this causes no inconvenience to pedestrians, as they use the base as a sidewalk.

The total cost of construction is 30 cents per square foot, which is practically the same as the cost of a portland cement concrete walk of the same standard. The above cost covers all charges for labor, material, auxiliary work, such as reconstruction or adjustment of other utilities, including hydrants, poles, private approaches, etc., and also a departmental charge of 5 per cent for overhead. This construction is carried on as a local improvement and assessed against the abutting property. For purposes of assessment, the cost of the necessary street and lane crossings is included. These crossings are constructed altogether of portland cement concrete slabs 6 inches thick at lanes and 7 inches thick at streets. This construction, together with the cost of construction interest, debenture, discount and flotation charges, is then assessed against the abutting property. We pool the whole season's program, including street and lane crossings, and set a unit annual rate per property foot or per lineal foot of walk of 16 cents, continuing for a period of 20 years. On this basis we have constructed 85.24 miles of this class of municipal improvement.

Some current rates for labor and materials affecting this class of construction are as follows:

LABOR

Common hand labor	.50 per hour
Skilled hand labor	.52 per hour
Team and teamster	.95 per hour
Cement finisher	.80 per hour
Asphalt rakers	.57 per hour
Portland cement concrete foreman	$1.00 per hour
Asphalt foreman	$144.00 per month

MATERIAL

Asphaltic cement—$29.00 per ton in tank cars f.o.b. paving plant
Paving sand—$1.75 per cubic yard, f.o.b. paving plant
Concrete sand—$1.90 per cubic yard, f.o.b. paving plant
Coarse aggregate—¾-inch crushed rock—$3.40 to $3.75 per cubic yard, f.o.b. job
Portland cement—95c per sack of 87½ pounds.

History of These Bituminous Sidewalks

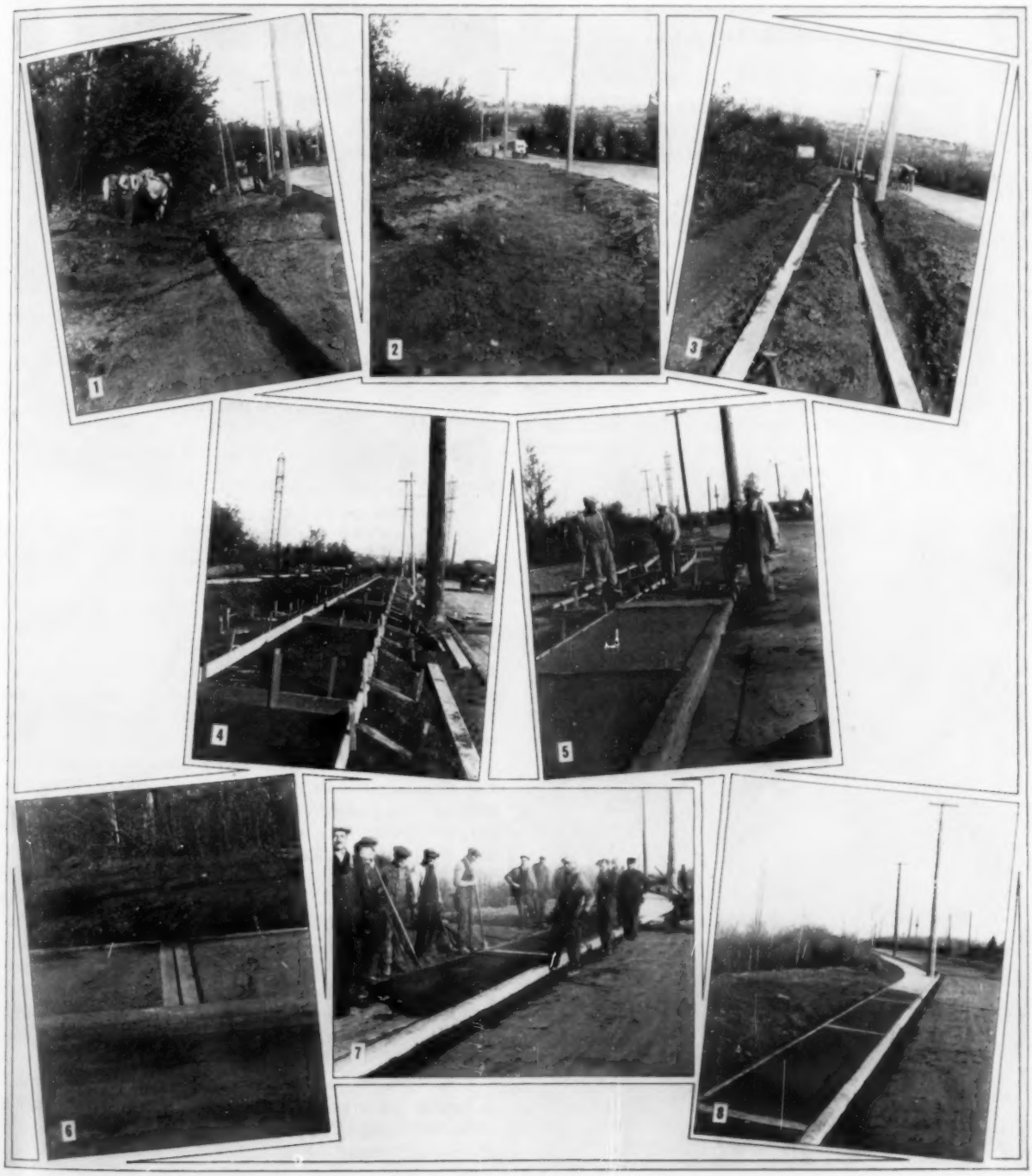
The type of bituminous construction described above was developed through the stress of circumstances. Prior to the World War, there was a great deal of speculation in city real estate, with the consequent abnormal expansion of city limits to 42.5 square miles. This expansion necessarily involved the extension of public utilities to serve a very scattered population, and many miles of plank walk were constructed. During the war and post-war periods, there was a drastic retrenchment in all public expenditures, and the plank walks fell into a serious state of disrepair, resulting in the payment of many claims for personal injury received in tripping and falling over loose and decayed plank surfaces. Many of the worst walks were dismantled and cinders substituted, first with 2-inch wooden edging and later with portland cement concrete stringers. The cinders, however, made a very unsatisfactory walk surface, both for pedestrians and for the adjoining household floors and carpets. It was then found necessary to surface some of these walks. The penetration method was used first, and later the central plant

mix. This surfacing immediately proved very popular with the public because of its resiliency. When we were able to get back to permanent construction, using portland cement concrete, the bituminous surfacing was retained as a feature of the permanent walk.

The general advantages of this construction, based on our experience in Edmonton, are:

1. A resilient surface for pedestrian traffic.
2. The finishing work can be carried on much later in the season.
3. It is free from sun glare. This is particularly important in Edmonton, where during the summer months it is daylight from 3:30 in the morning until 11 o'clock at night.

ACKNOWLEDGMENT.—From a paper read before the Ninth Annual Asphalt Paving Conference.



SUCCESSIVE STEPS IN LAYING A BITUMINOUS SIDEWALK ON A CONCRETE BASE IN EDMONTON, ALBERTA

1. Staking out the sidewalk area. 2. The area cleared. 3. Stringing out the form lumber. 4. Forms set for the concrete base. 5. Spreading the concrete base. 6. An expansion joint. 7. Raking-in the bituminous top. 8. A complete walk

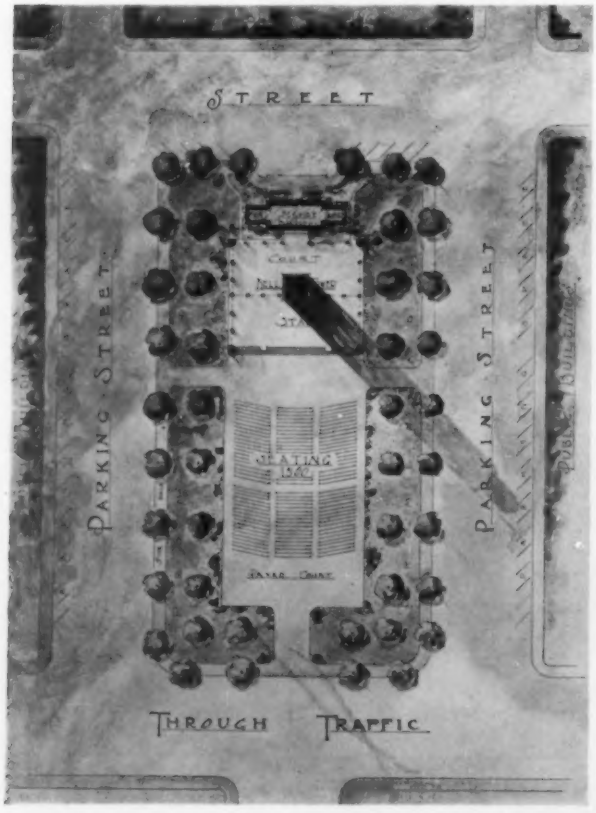
Community Bells and Singing Towers

By MARCIA MEAD, A.I.A.

MOST communities of today have grown up in a hit-or-miss fashion without plan, and the quality of unity is lacking. In one of our mid-western towns is a Rotary Club, a typical classification organization. The leading churches are Methodist, Episcopal and Roman Catholic, whose minister, rector and priest are universally liked and respected gentlemen. But such is the intangible touchiness of public opinion that the Club does not dare to invite one of them into its membership as a religious representative. And so the religious side is left out of the program. One day in the village grocery the priest met the Club president, with whom he was on most amiable terms, and with a twinkle in his eye said, "Here we meet on common ground."

As we pass through village after village on a day's motor journey, we automatically read the personal greeting, "Goodby, come again," but too seldom is there any feature about the place which, for its own sake or that of the town, would entice us unnecessarily to pass that way again. We miss the old market place or village green with its town crier where the townspeople gathered together to learn of the goings-on in the world, and where the public offender was reprimanded or punished. Here was *common ground*.

DESIGN OF THE BELLTOWER, OR CAMPANILE
An aircraft beacon is proposed for the top. Plans include night lighting of the whole area. This and the plan below are by Marcia Mead



PLAN FOR A VILLAGE GREEN
Here the author visualizes the bell tower with a stage at its base, and provisions for an audience of 1,500 for plays and concerts

Civic order will eventually be brought about by our city planning boards, which are gradually acquiring the technique of proper arrangement and placement of civic features, but to ring true, the community should be alive with the spirit and interest of the people themselves.

A Natural Nucleus of Common Interest

The village green is the natural nucleus of common interest, worth razing half of Main Street to acquire. Many towns are already creating civic centers at these open places, grouping about them public and other important buildings. But the speaking voices of the town criers are lacking, voices that will reach out and draw the people together.

There is an answer to this need as old as history and as new as the calendar day—the far-reaching challenging voices of bells. The impersonal simplicity of bells and their great versatility of expression possess a universal appeal which give a campanile, or bell tower, unusual possibilities as a dominating community feature.

There is no end to the service which bells can render to community life. They toll off the hours in accurate fashion, and all the people listen and set their clocks to

Van Natta

THE SINGING TOWER, MOUNTAIN LAKE, FLA.

The Gold Medal of Honor of the American Institute of Architects was awarded the late Milton B. Medary for the high excellence of this design. There are 71 bells

an even stride; they translate the glorious melodies of carols and folk songs without the limiting quality of words. Their voices reach each and all, regardless of color or creed, and pleasurably arouse their minds to universal attention.

Ringing Through the Ages

It is impossible to trace the origin of bells. They must have come into being with the discovery of the sonorous quality of metals, in the working of which the ancients were adept.

The word "bell" seems to be derived from the Anglo-Saxon *bellan*, meaning to roar, but a writer of eastern lore claims that bells were named after the sun-god Baal or Bel, because he was considered the author of vibratory motion and the source of musical sound, which is a far more intriguing fancy.

The metals employed in the manufacture of the oldest bells of which we have record were the same as those now in use, copper and tin, the proportions alone being different. The long experience of the ancients, as well as careful tests of later years, has clearly proved that these are the only metals capable of producing a proper ringing alloy. Iron and steel, and even silver and gold, frequently entered into the composition of bell-metal, but always to the injury of the tone.

The quality of bells depends also upon their shape and proportions of height, width and thickness. In their manufacture these details are accurately designed and definitely specified.

The earliest bells were small, and the Hebrew scriptures tell of their being attached to the sanctuary garments of the High Priest. Their soft tinkle-tinkle held the attention of the worshippers and added to the mystery and impressiveness of the temple service. Bells were attached to the anklets of women as they are even now in many of the eastern countries. They were also hung about the necks of horses, and to this day the bell-wether sheep leads the shepherds' flocks.

It is believed that large bells were first made by the Christians, who erected church towers for the sole purpose of housing the bells, as the name "campanile" indicates.

The tongues of bells are articulate, pouring out their messages of joy, calamity or woe:

"To call the fold to church in time,
We chime;
When joy and mirth are on the wing,
We ring;
When we lament a departed soul,
We toll."

And so on in their peculiar code. The nature of their messages often give name to their ringing, as the Angelus, the Vesper Bell, the Passing Bell, the Tocsin or alarm bell.

A single bell has great possibilities of expression, depending upon the skill and fancy of the bellringer. The voice of a bell is really a chorus of bells, the tone being many tones blended, for bells change their shape when they are struck, producing many overtones.

It was a great event on my native countryside when, by means of basket parties, sugar-offs, and the many other neighborhood devices for the raising of funds, we were able to purchase a small bell for our district school, which was our neighborhood center of activities.

Brown Brothers

THE SPRINGFIELD, MASS., CAMPANILE

This dominates the municipal buildings group designed by Helmlee and Corbett, and is the dominant motif of the present and proposed civic center

A GIFT TO ALSTEAD, N. H.
This tower and chime, with the park in which they are placed, were the gift of Charles N. Vilas to his native town

Each pupil was eager on a school day to be permitted to ring the bell. I can feel the rope now in my hands and sense the response of the bell and the thrill of producing those beautiful tones with clear, unbroken rhythm. It was something like being a god.

Peals, Chimes and Carillons

A "peal" is a group of three or four bells with which may be produced numerous pleasing changes, but not a melody or tune. The "Westminster peal," or "Cambridge quarters," requires four bells and is perhaps the most popular combination. The Metropolitan Tower in New York has a fine Westminster peal placed 650 feet above the sidewalk, the world's highest bells.

A "chime" is a set of bells upon which tunes may be played, the minimum number being eight bells attuned to the notes of the octave. It is not necessary to have a large number of bells in order to obtain satisfactory and pleasing results. The quality of tone, ease of ringing, and variety of melodies for different occasions, are more important. Though there is no limit to the number of bells which can be used in a chime, a group of twelve bells will provide ample range for community use.

Not until the seventeenth century were the mechanics of operating bells so perfected that they could be rung by playing upon a keyboard, or clavier, similar to that of an organ or a piano. This made the whole group into a significent musical instrument more modernly known as a "carillon," a French word meaning the same as "chime."

Great are the mysteries of bell ringing. Said Ben Johnson, "If a bell have sides, the clapper will find 'em," but the proper ringing of bells requires considerable experience and skill. The number of changes that can be played upon a chime of 12 bells is 479,091,600, which taxes the skill of the professional. The most successful ringing of bells is an art requiring a high quality of musicianship.

Among famous bell masters have been Josef Denyn, Caesar Franck and Verbeek, of whom it has been said: "His bell music surpasses the finest organ tones." Artists like these are beyond the reach of the average community, and to have only a part of a player's time means that the bells will be silent when he is not there. But the claviers are now so simple and easy to operate that any good musician can soon learn to play a chime. Every weekday evening and twice on Sundays a 13-year-old girl named Charlotte Lemon plays the beautiful chime in the tall spire of the First Methodist Church of St. Petersburg, Fla., to the delight of a multitude of listeners. Any one who can play chimes is at liberty to ring the eleven large bells in the bell tower of Riveredge Farm, the Joseph C. Sibley estate near Franklin, Pa.

A mechanism has also been perfected whereby bells can be operated automatically, playing an entire repertoire of melodies. While any mechanism always falls short of the touch of a skilled hand, it makes a community carillon possible wherever electric current is available.

Community Bells

There are as yet few community bells. Not long ago an interesting chime of twelve bells was given the town of Alstead, N. H., by Charles N. Vilas. On one of his travels Mr. Vilas enjoyed so much the melodies of the bells of the Bible Institute at Los Angeles that he wanted his townspeople to have the same beautiful music. So he gave them a gracious park containing a bell tower and chime.

More than a community feature is the Singing Tower at Mountain Lake, Fla., which has been called the Taj Mahal of America. Here Edward Bok turned one of the waste places into a delightful sanctuary for birds and planted there the Singing Tower for the enjoyment of everyone who knows about it and listens to the music of its bells. Often their voices are broadcast throughout the country. Listen-in some time and feel the spell of one of the world's greatest bell-masters, Anton Brees, who has played most of the great carillons of the world.

One of the few community bell towers is a part of the municipal group at Springfield, Mass. It is a graceful, dominating structure housing a chime which marks the hours and plays a number of melodies every day and on patriotic occasions.

There are various ways of securing a community chime. When a civic group of buildings is planned, as at Springfield, its cost could well be a part of the construction budget. Another way is for some public-spirited citizen of wealth to present it to the community, as did Mr. Vilas.

A Singing Tower on a Village Green

A community carillon is, however, the canniest, most eloquent and most appealing of projects whereby public interest may be aroused, and is a fit endeavor to be realized through the efforts of some civic group, which may be organized for this express purpose and which may appropriately perpetuate itself as the "keeper of the bells."

The author submits the accompanying design as a suggestion and inspiration for such a singing tower. The village green, as indicated on the plan, may be so arranged that it will serve as a place of assembly, with the bells and tower forming the background of a stage setting for open-air concerts, theatrical productions or public speeches. The borders of the green are flanked with trees and shrubbery arranged in an attractive park setting to cut off the sounds of the street. The top of the tower is a friendly beacon for travelers of the air, pointing the way to landing fields, which are fast becoming functioning features of our modern towns.

"This is the age of the air. It is peculiarly fitting that we should voice this spirit in our carillons, the orchestras of the air." If it is possible to ring out an age of pessimism and discontent and ring in a new era of peace and good-will, it can be done with community bells.

Telling Citizens How the Public Job Is Done

The Drafting of Functional Municipal Reports; Comprising Part II of the Discussion of the Preparation of Public Reports, Begun in the April Number

By **WYLIE KILPATRICK**
Executive Secretary,
National Committee on Municipal Reporting

OF what should a public report consist? What should be its subject-matter? How should it be presented to appeal to the interest of readers? A statistical measurement by Dr. R. G. Reynolds reveals the direction of the interest of the readers. From a large number of newspaper clippings on the health of school children, fifty judges selected ten articles as representative of different types of public appeal. Four hundred and three people, acting as a readers' panel, ranked the articles in the order of preference. The group lived in 35 states and were members of 10 occupational classes. Without regard to their occupation, the readers were agreed in their judgments which significantly awarded first place to the article entitled, "Public Schools—What Schools Have Done, Are Doing, and Will Do."

The title not inaptly describes the arrangement of the report. The *doing* of the public job, the execution of the public trust, the measurable accomplishments, form the subject-matter around which the report should be organized with the greatest reader appeal. Organization and personnel are necessary as a background to understand public services; and cost must be known to appreciate the financial effect. The distinguishing feature of the "service report" is its emphasis of work performed shown in relation to the complementary subjects of organization, personnel, facilities, and financial cost.

Introduction—Résumé of Results

The sole topic of the introduction is a resumé of the year's work, the accomplishments outstanding during the year. Here is the opportunity for the department to put its case before the public. What has it done? The answer should be the unvarnished record stripped of details and descriptions. The amplified report, interpreting the work or explaining the difficulties, comes in a later section. For the introduction should be reserved the summary, which sometimes may take the form of title-line statements enumerating the accomplishments. An enumeration, however, is serviceable only occasionally. It is devoid of interest upon repetition. A preferable method of reporting is to organize the introductory paragraphs around the problems confronting the department. It may be the problem of a street pavement program, the construction of a school or playground, or the introduction of a budget system or health campaign. These subjects, directly affecting the lives of the residents, will awaken instant interest if they are presented not as algebraic and engineering calculations but as issues whose results will determine the kind of city in which the readers will live. To what extent the problems have been solved or lessened is nothing else than the yearly record organized around the cardinal issues.

Often the heart of the record, the nub of the results reported, may be stated in a résumé table. An instance is the following statement which sets forth the cardinal facts determining the extent of fire losses and the work of the fire department in abating fire hazard.

Starting with an initial statement of the number of fires and amount of fire loss, the table computes the fire

Year	Number of Alarms	Number of Fires	Amount of Fire Loss	Fire Loss per Capita	Fire Loss per Fire	Valuation of Burnable Property in City	No. of Fires for Each $1,000,000 of Burnable Property	Amt. of Fire Loss For Each $1,000,000 of Burnable Property
1931..								
1930..								
1929..								
1928..								
1927..								

loss per capita and per fire. These are indicative computations showing the extent of fire hazards in the city, although far from conclusive. Of more significance is the relation of fire losses to the valuation of burnable property in the city. For the burnable valuation represents the "load" or degree of responsibility of the department in protecting property. The ratios of the number and amount of fire losses to burnable valuation constitute tentative indexes, the best as yet available, to trace the adequacy of fire administration. Other indexes, standing for functional performance, may be reported in the introduction that summarizes the annual work.

Organizations

No fair or accurate appraisal of the work or performance is possible without a clear-cut understanding of the organization responsible for its administration. The need to delineate clearly the organization arises first because of the ambiguous use of terms like "public welfare," "public safety," or "public affairs," which may and often do cover a multitude of diverse agencies. To afford a basis in fact for a knowledge of the exact function in a given city, as well as to facilitate comparisons between cities, an unmistakable definition of the agency must be drawn. The need is intensified because the organization is working in conjunction with other departments, state officers, and often private agencies.

The report should portray by chart and exposition four aspects of organization: (1) the bureaus embraced directly under the administrative control of the department and the lines of accountability to the appointive or elective authority; (2) the companion city agencies or de-

partments with which the work of the department is correlated; (3) the private agencies, concerned with allied work, with which the department cooperates; and (4) the relations of the municipal agency with corresponding county and state departments. The functional problems, previously set forth in the introduction, here find the outline of the organization set up to grapple with the questions.

Facilities for Citizen Use

Closely allied to the outline of organization, if not a part of it, is a statement of departmental facilities available for use by citizens. The functional problems demand an organization whose administration means a variety of facilities, with some of which the resident may be familiar and with many of which he is unacquainted. Only in exceptional cases do reports present the information the citizen should possess to make the best use of the services offered. How, where, and when he should seek departmental aid, and what changes in state and municipal regulations are of especial importance to him, should be explicitly reported. The statement simply is to carry the organization report one step further by relating the activities and personnel and existing facilities for citizen use which are required to meet the local problems. The organization chart, in itself, may be used to report facilities diagrammatically in addition to showing official agencies.

Cost and Personnel

A radical departure is recommended in reporting cost and personnel. Only to the specialist do elaborate cost and personnel tables have any significance. And even to the expert (if not more to him!) cost and personnel acquire meaning only in relation to services and other factors. That is to say, the finances and officers are not disembodied subjects to be treated, each separately, and then dropped.

Two statements are recommended for use initially in a statistical analysis to be followed by an interpretive exposition. The first correlates the organization with finance and personnel. Restated, the finance should be expressed in terms of organizational or functional activities within the department. The police department, for instance, would be broken up into units of general administration, police school, property and records, detective and identification, traffic, licenses, special squads, and the precinct organization. For each of these items, standing for an organization unit, should be stated the expenditure and the personnel.

By means of a report of this character two objects would be attained. The endless rosters of officials, possessing limited interest, would be eliminated; and for the diffuse financial tables would be substituted a cost statement by functional activities that permits of comparisons where now comparative costs are invalid. In place of broad terms, as recreation or education, under which comparisons now are made, are substituted the more precise units actually embraced in these or other functions in an individual city.

Functional Services

The second recommended statement is a report of services with which cost is correlated as an explanatory factor. Only too readily may the report of services miscarry in the effort to present a full statement of the year's work. It may become a detailed record of the work of each bureau. It may present the engineering facts regarding every street paved and every sewer installed. It may present cost accounting data showing to a decimal point the cost of every sewer manhole. The public report is none of these things. It is grounded upon carefully selected data related to the problems mentioned in the introduction. In the same fashion that the introduction summarized the problems and the accomplishments towards their solution, and the outline of organization made clear the responsibility for handling the problems associated with the activities, so this section will report the current services that form the year's effort to solve the problems.

The systematic report of services requires the presentation of the data in accordance with the organization of activities. One report form cannot fully encompass all the activities of the department, but it can present a comprehensive record that affords the basis for explanation in the accompanying narrative. The report should be of the volume of work done and the unit cost of performance. Since such measurements and computations are in an experimental state, the report can present no conclusions but tentative data that may be accepted as indicative of the character of the services. The analysis of services in one department is presented as an example.

SERVICES OF PUBLIC WORKS DEPARTMENT

Service by Bureaus	Volume of Work 1931	Unit of Work 1931
1. *Administration and Accounts*	(a) Total No. employed supervised	(a) Per employee of dept.
	(b) Total funds expended	(b) Per dollar expended by dept.
2. *Planning and Design*	(a) No. projects planned	(a) Per project of dept.
	(b) Total expenditure involved	(b) Per dollar involved
3. *Streets and Alleys*		
(1) Repair work	No. sq yds. repaired	Per sq. yd.
(2) Sidewalks	No. sq. ft. laid	Per sq. ft.
(3) Pavement	(a) No. cu. yds. excavated	(a) Per cu. yd.
	(b) No. ft. of curbing laid	(b) Per ft. laid
	(c) No. sq. yds. foundation	(c) Per sq. yd.
	(d) No. sq. yds. surface	(d) Per sq. yd.
4. *Sewers*		
(1) Maintenance	(a) No. of manholes	(a) Per manhole
	(b) No. miles pipe maintained	(b) Per mile maintained
(2) Construction	(a) No. cu. yds. excavated	(a) Per cu. yd.
	(b) No. lineal ft. pipe laid	(b) Per lineal ft.
	(c) No. catch-basins installed	(c) Per catch-basin
	(d) No. manholes	(d) Per manhole
5. *Refuse Collection*		
(1) Refuse removal	Total quantity in tons	Per ton
(2) Refuse disposal	Total quantity in tons	Per ton
6. *Street Cleaning*		
(1) Regular cleaning	No. curb-miles cleaned during year	Per curb-mile
(2) Snow removal	(a) No. of miles plowed	(a) Per mile plowed
	(b) No. cu. yds. removed	(b) Per cu. yd.
7. *Public Buildings*		
(1) Cleaning of buildings	No. sq. yds. cleaned	Per sq. yd.
(2) Other building maintenance	No. cu. yds. of bldg. space	Per cu. yd.
8. *Standards (or Inspection)*		
(1) Examination of plans	Total No. plans examined	Per plan
(2) Inspection of buildings	Total No. bldg. inspections	Per inspection
(3) Plumbing inspection	Total No. plumbing inspections	Per inspection
(4) Elevator inspections	Total No. elevator inspections	Per inspection

The Use of Measurements

The value of the report of services will depend to a large degree upon the interpretation of the figures in the report narrative. Their value arises from the comparative use to which the figures may be put. The table records the unit costs of work for a three-year period, which may be extended for a longer time. The comparison,

then, is in the same city between different years when the same city organization is charged with performing the function. The more obvious influences that vitiate comparisons need not enter into this comparison. The topography in which the work is done is the same in all years. The natural resources hindering or facilitating the work are the same. The methods of work, if not the same, are under the direct control of the department and may be varied in the discretion of the officers as a means of testing results. The specifications of contracts or of building and maintenance plans will be the same, or subject to the same controlled changes, as are administrative methods.

Comparison of results within the same city between different time periods at once is the safest guide and the most limited of measures. The comparisons between cities are more illuminating in contrasting the variety of procedures or results; and, when introduced, they should be subject to the qualifications that render comparisons within a city relatively safe. That is, any variation due to topography, natural resources, social conditions, or administrative organization and methods must be part of the report in evaluating the results.

The record of services may be termed a controlling table from which a number of subsidiary reports may be drawn. Street paving and maintenance may be recorded according to the specific projects currently undertaken. Refuse collection may be reported according to the different methods invoked for collecting and disposing of refuse and the discernable differences in service and cost.

Future Program

The public report which had its introduction in a summary of problems, and the accomplishments centering around the problems, has its natural outcome in the program drafted for future action. The problems of administration have been stated in terms of the activities undertaken by the department; they have been related to the organization bureaus and personnel responsible for their solution or lessening; they have been stated in terms of the annual record of service which is susceptible of analysis to reveal the "strong" and "weak" spots of administration. Inherited from previous years, the problems have yielded to a departmental attack that has brought their solution up to the point recorded for the current year. What must be done in the future?

The report of departmental facilities shows a record that in any city is never 100 per cent complete. Or, if seemingly complete, the job of replacement and of furnishing facilities to accompany the city's growth creates a continuing task that is always new. What remains to be done—and it is always enough—constitutes the future program. Too frequently, however, the future work has remained nebulous and has escaped formulation into a program. The budget for the ensuing year must be drafted. The unit costs of service are projected ahead for the coming year. Hence in the estimates for that and later years, the guesses for appropriations will be replaced by computations that accord with the predictable volume of work and the consequent cost. The program, related in successive years to each stage of development, should reveal at a glance the annual increments of cost, the method of financing by taxation or borrowing, the effect upon the tax rate and special assessment levies, as well as the exact improvements embraced within the program.

Suggested Outline of Contents for an Annual Municipal Report

PART I

THE CITIZEN—HIS SHARE IN THE MUNICIPAL JOB

1. What the Citizen Does
2. What the Citizen Gets—A Résumé of Services
3. What the Citizen Pays—A Fiscal Summary

PART II

GENERAL ADMINISTRATION

1. *Who are Responsible for Doing the Job—*
   The Structure
2. *The Work of the General Departments*
   Determining Civic Policy: The Council
   Coordinating Administration: The Executive
   Adjudicating Rights and Obligations: The Courts
3. *The Staff Agencies Serving Other Departments*
   The Municipality as a Fiscal Organization: Finance
   The Municipality as Legal Counsellor: Law
   The Municipality as an Employer: Personnel

PART III

SERVICE AGENCIES

1. *Education in the Community*
   Performing the Public School Function
   Administration of Libraries
2. *Promotion of Social Welfare*
   Conserving the Public Health
   Stabilizing the Public Welfare
   Providing for Public Recreation
3. *Public Safety in the Municipality*
   Affording Police Protection
   Prevention and Protection Against Fires
4. *Public Works and Physical Plant*
   Rendering the Public Works Functions
   Public Utility Services to the Citizen-Consumer

PART IV

THE CITY TOMORROW—PENDING MUNICIPAL PLANS

1. Municipal Problems and Projects under Consideration
2. The City Plan and Future Program
3. Financing the Future Program

—Twelve pages in the monograph "Public Reporting," on which the foregoing article is based, and which is reviewed in this issue, attempt to coordinate sections of a municipal report into a unified record and interpretation of the year and its implications for the future of the municipality. The object is to substitute a coherent report for the haphazard piling-on of departmental reports between the two covers of one publication and calling the result the city report.

Part I, "The Citizen—His Share in the Municipal Job," is designed to clarify, in the mind of the voter, the part he plays in the local civic process.

Part II, "General Administration," aims to portray an authentic background against which the citizen understands what is happening in the general departments.

Part III, "Service Agencies," purposes a veracious record of functional services, their measurable accomplishments or failure to accomplish.

In conjunction with the plans and proposals discussed in Part IV, "The City Tomorrow—Pending Municipal Plans," the report will constitute a rough measuring rod by which, without any great ballyhoo, the officials can submit their record to the public.

Any prearranged plan is extraordinarily difficult because of the shifting interest of both the reporters and the readers. Hence a stereotyped form, prescribing every detail, might succeed in improving a report one year and prove a "dud" the following year. The reporting form should be lent to local circumstances rather freely. That is, the order and arrangement may be changed if and when by so doing the report of a particular year is made more readable. The next year the arrangement might be shifted again

County Planning Proves Its Value

A Discussion of the New Mercer County Plan in Particular and of County Planning in General

By **RUSSELL VAN NEST BLACK**
Planning Consultant

MERCER COUNTY, NEW JERSEY, may claim the distinction of being among the first counties of the United States to prepare comprehensive master plans.

The Board of Freeholders appointed an official County Planning Commission in October, 1929, under a very general State Enabling Act. This Commission employed a consultant and established a working office in the Department of the County Engineer. About fifteen months were consumed in making the plan and in writing the report, which has since been printed for general distribution.

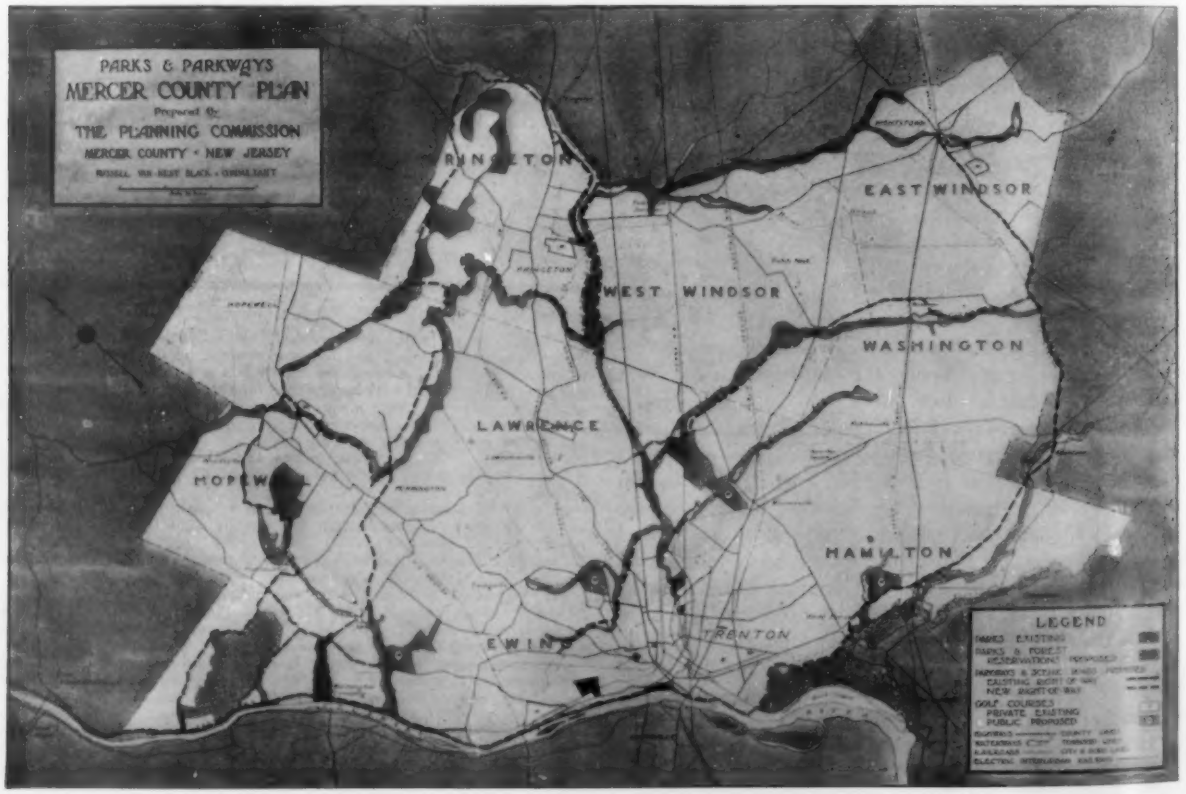
Mercer County, with an area of 233.8 square miles, comprises a rather well-defined sub-district of the Philadelphia Tri-State Region. With few unimportant exceptions, proposals of the Tri-State Planning Federation have been incorporated in the County Plan.

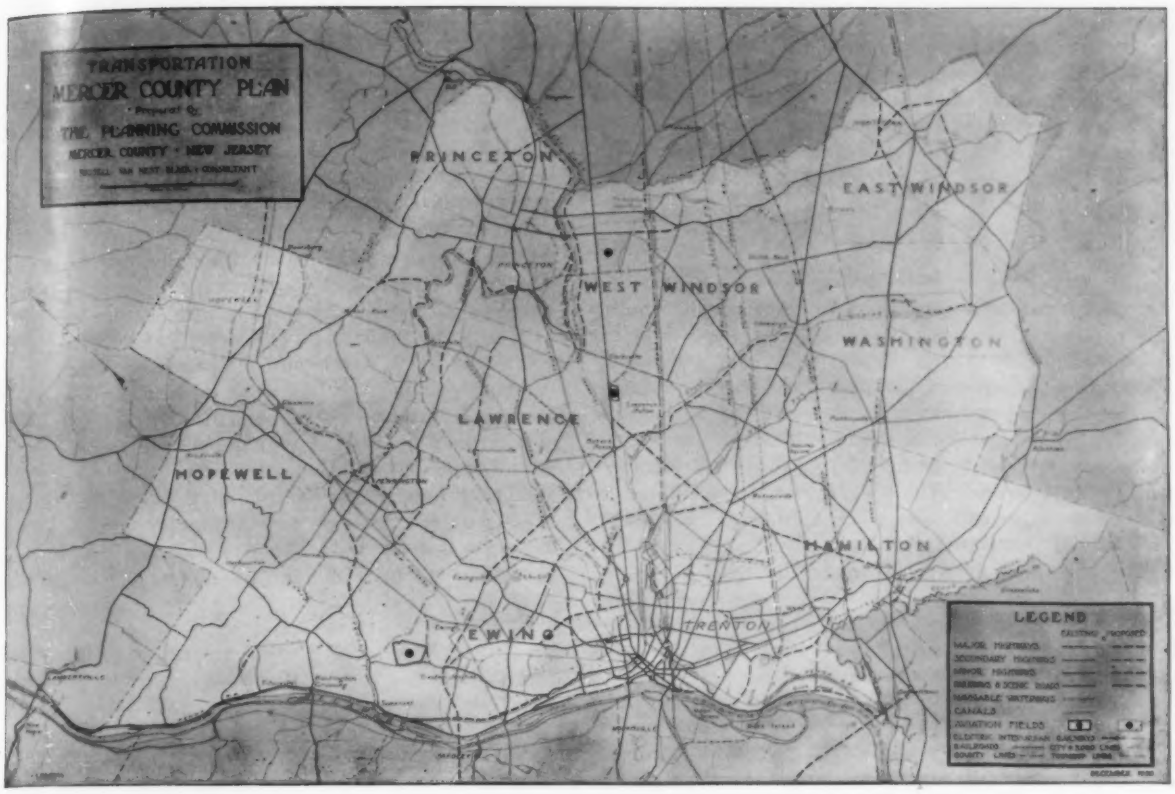
Mercer is the capital county of New Jersey, with Trenton as its central city. The county's population, according to the 1930 census, was 185,000, nearly two-thirds of which is represented by the city of Trenton. Fortunately or unfortunately, Mercer County lies midway between New York and Philadelphia, directly in the path of communication between these two metropolitan areas. This location has contributed unusual transportation facilities by air, rail, and road, but at the same time has resulted in unusual complication in the handling of traffic and in the orderly development of property.

In preparation for the plan, careful studies were made as to the growth probabilities of the county, as to both quantity and direction. Extensive other factual data were obtained as to physical characteristics, industrial trends, and the financial condition of the county and its political subdivisions. An air map at a scale of 1,500 feet to the inch was available, as well as special enlargements of the United States Geological Survey maps.

Present and Future Uses of the Plan

With these facts as basis, the Commission and its consultant have arrived at the Master Plan illustrated herewith, for which they make no pretension except as a general guide for the future development of Mercer County. The plan is already being utilized by the County Board of Freeholders in programming highway construction, and several plan projects are now under way. It is expected that out of the plan and its analysis of the recreation needs of the county will grow the creation of a park commission which will proceed to place Mercer County on a par with other New Jersey counties in parks. The plan should also serve as basis for the making of a five-





or ten-year capital budget. While recommending the making of such a budget, the Planning Commission has considered this to be a special function to be accomplished by a separate and specially qualified commission or committee.

Not the least expected benefit of the plan is that it will serve as guide for the several municipalities of Mercer County in preparing their more detailed local plans. New Jersey does not extend zoning power to counties as such. Nor do New Jersey counties have control of land subdivision. Both of these functions have been delegated to municipalities under general municipal enabling acts applying alike to all subdivisions of the county—cities, boroughs and townships.

Considerable progress has already been made in gaining the cooperation of Mercer County municipalities. Before, after, or during the process of county plan making, six of the thirteen municipalities have zoned, and four of these six have prepared more or less comprehensive local plans.

The county is increasingly recognized as a logical planning unit. County boundaries, determined more or less by expediency and usually established long before present-day trends were evident, naturally do not always conform to boundaries of logical physical, economic and social entities. But they are much more likely to be inclusive of the logical planning unit than are the usual city boundaries.

This is particularly true in Mercer County, where the principal city, Trenton, is already built up to its municipal limits with most new growth taking place in surrounding townships over which Trenton has no control. Annexation is a difficult and uncertain matter. Under such conditions as those of Trenton and its adjoining municipalities—a situation common throughout the United States—there is little hope of coordinated expansion except through a plan fostered by some joint or central authority. It would seem that this frequently can best be accomplished by a county planning commission, adequately financed to make a good plan and willing to put forth special effort to bring about the full cooperation of the various municipalities concerned.

An Aid to Economy in County Expenditures

Although frequently enjoying exceptional planning opportunity, as suggested above, counties generally have been notoriously guilty of loose spending of public funds. They have usually encompassed comparatively large and formless areas with road mileage many times what could be improved within a foreseeable period. Much road improvement, therefore, has been done in response to public or political clamor rather than from the point of view of relative need and urgency. Until recently there has been little thought of county growth and expenditure according to plan.

It has been and still is true that many remote counties have little to be concerned with except making their areas accessible by passable roads and bridges. But a new era has fallen upon those counties in metropolitan regions and surrounding or adjoining the larger cities. Such counties must meet the paradoxical public demand of better service with diminishing tax burden. This demand can be met only by the economies possible through building according to a well-prepared and well-maintained county plan.

The Mercer County Planning Commission wisely insists that its general plan as submitted to the Board of Free-

holders is not and probably never will be finished. As is usual, the plan has been prepared without accurate topographic data. It is of necessity, therefore, only general as to its recommendations and must be adjusted from time to time as new information becomes available. It is recognized, also, that unforeseeable shifts in population trends or modes of living may make other important changes desirable.

Keeping the Plan Up to Date

This quality of such plans was recognized from the beginning, and steps were taken to insure continuous plan study. Much of the work of plan-making was done in the Commission's office at the County Court House under the observation of the County Engineer, who will have a large part in carrying out the plan, and with the help of one member of the County Engineer's staff now to be assigned permanently to the planning job. As further insurance of continuous operation, the Commission's consultant has been retained for follow-up work, an arrangement always desirable for best results.

The plan itself has been largely limited to highways, parks, and aviation facilities. Waterways and railway necessities have already been foreseen with a fair degree of satisfactoriness. Water-supply and sewerage problems have been recognized but, in the instance of Mercer County, must be dealt with by specially created districts. Cooperation toward this end among the municipalities concerned is being urged by the County Planning Commission. Housing and other elements in public and private welfare were given study, but have occasioned only general recommendation.

Under local conditions the foregoing appeared to be the desirable limit of the first effort of the Mercer County Planning Commission. The problem, of necessity, will vary with the individuality of every county. The important things are: to recognize the planning potentiality of the county unit; to get the work started on a sound basis under the direction of an official county planning commission; and to keep the work going as a permanent function of county government.

A next logical step in planning for Mercer County would be the large-scale precise topographic mapping of the areas that are most likely to undergo early development, and the more definite fixation of major plan features.

Proper Directions for Public Effort in Housing

By THOMAS ADAMS

THE real housing problem is divided into two parts; the housing of those who cannot pay an economic rent for healthful accommodations; and the housing of the greater majority of wage-earners who can pay an economic rent. The former is a social problem involving some measure of public assistance; the latter is a political problem involving the highest degree of government leadership and control. There is no defect due to private action that cannot be traced to public inaction.

The worst housing defects originate in the methods of developing and planning land, and are succeeded by other defects in permitting excessive building on the land in subsequent stages of development. When we can obtain adequate space about buildings for health, safety, recreation and locomotion, and not before, we shall have a problem that is susceptible of adequate solution.

Public and Private Action

Once the congested slum is established there can be no solution of the problem except at enormous cost to the community. There is no way to secure adequate improvement of the Lower East Side old-law tenements except by substituting sanitary rookeries for unsanitary rookeries or by public aid. But public aid should not be given by building houses. The directions for public effort are: to acquire parts of blocks for playgrounds, stimulating building by private enterprise; to assist in reducing costs of money for building; to promote transit developments into the open environs of the city; to restrict by zoning the density of building and families per block or acre; to require spaces about all buildings and restrict depth of all buildings so as to obtain adequate facilities for light, air and recreation; to encourage developments of private corporations such as the City Housing Corporation and the use of building and loan associations.

No workingman gets the benefit of flimsy construction or land overcrowding in cheaper rents. Those who profit from these things have always excused themselves by saying that they are the providers of cheap homes and that without their flimsy building and dark rooms the poorer wage-earners could not obtain accommodations. There is probably no greater fallacy. It is as if we said that, as the working man could not pay for good meat, we must permit the sale of decayed meat even if it destroys his health. Rents and prices of wholesome accommodations will adjust themselves to what the working man can afford to pay, if, and only if, we prevent the erection and use of unwholesome accommodations.

Among the directions in which public enterprise could usefully be employed is the purchase and development of land in suburban areas for small homes to be erected by private builders and financed by building and loan associations. Such land should preferably be leased and the profits all turned back into providing public improvements. There is no legal difficulty that cannot be overcome to carry out this method of assisting good housing.

The most deplorable thing about housing in New York has not been the greed of owners of land and houses. This is no greater than in other fields of commercial enterprise. It has been the attitude of public authorities and officials toward this question of housing. There are cases now where officials not only permit and tolerate bad housing, but defend it. They claim that they do so because they believe that cheap houses are all that the poor people can afford; but the cheapest houses are in effect the most costly, and the builders of them naturally levy upon them all that the traffic can bear. . . .

The lack of proper regulations results in community as well as individual losses. Every bad house is a liability to the city, socially and financially.

—From a recent address before the Housing Section of the Welfare Council of the city of New York.

Linings for Water and Sewer Pipe and Their Effect on Pipe Coefficients

By ALEXANDER POTTER
Consulting Engineer, New York

THE provision of a special lining for cast iron pipe, or, in other words, a lining in place of the ordinary tar coating commonly applied to cast iron pipe, in order to reduce the cost of carrying capacity normally produced by the tuberculation of the interior of the pipe, is of considerable economic importance in water-supply systems through which an aggressive water must be distributed.

The provision of a special lining is also of particular importance for cast iron pipe used in connection with sewerage works, as in force mains, and in special cases involving strict leakage requirements, as, for instance, in the case of a sewer so located as to endanger the purity of a water supply. In the case of a force main it is of importance in preventing a constantly increasing pumping head, and in the case of a gravity line it is of equal importance in reducing permissible gradients, resulting oftentimes in limiting excessive depths, or obviating the necessity of increasing pipe sizes.

That the roughness of the interior of the pipe is of major importance in fixing the capacity of the line is of course a well-known fact. The friction coefficient, or index of this roughness, therefore, bears a definite relation to capacity, which is emphasized by the following example:

Taking as a base the capacity of a cast iron pipe with an average condition of interior surface, and assuming the commonly used value of the Hazen-Williams coefficient, C = 100, the relative capacity with a fixed loss of head per 1,000 feet will be 80 per cent capacity for a value of C = 80; 90 per cent capacity for a value of C = 90; and 100 per cent capacity for a value of C = 110, and so on.

The value of the coefficient under actual working conditions varies in some cases from less than C = 80 for old and badly tuberculated pipe, to C = 150 or higher for new pipe with an unusually smooth lining, and the capacity in the latter case is 87½ per cent more than in the former case, assuming the same head loss.

The effect of this difference of coefficient on cost of construction was brought out in a recent design involving a line of cast iron pipe some 15,000 feet in length.

Substantial Economy Made Possible by the Use of Pipe with Special Lining

The effects are somewhat exaggerated in this example, in that the relations are more marked than with ordinary water-works construction. The line in question was a sewer for which cast iron pipe was required for the protection of a water supply, the line being laid along the shore of several reservoirs, most of it to be laid below the water level of the reservoirs, and the depth of excavation was of course greater than the depths occurring in ordinary water-works practice.

The only fixed requirement aside from the determination of the most economical design was the necessity for providing a capacity of 7.5 million gallons daily. The critical part of the line, which was 4,600 feet long, was laid around the upper reservoir, and this section is the subject of the following analysis.

In Case I a 24-inch cast iron pipe with a permanent smooth lining was used, and consequently a value of C = 140 was assumed. The pipe was placed on the minimum slope which would provide the required capacity. The total cost for a length of 4,600 feet was estimated to be $65,000; only 2½ per cent of this amount being chargeable to the lining of the pipe.

In Case II a 24-inch cast iron pipe with the ordinary coal tar coating was used, and a coefficient of C = 80 was accordingly assumed. The pipe was placed on the slope required to develop an equivalent capacity to that in Case I. Owing to the substantially greater excavation involved by the requirement for a steeper slope, the total estimated cost was $94,000, or $29,000 greater than the cost in Case I.

In Case III it was assumed that the pipe would be laid on the same slope as in Case I, and that it would be cast iron pipe with ordinary coal tar coating. A value of C = 80 was therefore assumed, and the pipe was selected of such diameter as to give the required capacity. It was found that a 30-inch pipe was needed. The estimated cost in this case was $77,000, or $12,000 more than in Case I.

Summarizing the above results, it will be seen that the use of a permanent lining effects a saving of $29,000 over the cost of a pipe with ordinary tar coating on a steeper slope, and a saving of $12,000 over the cost of a larger pipe with the ordinary tar coating.

Cement Lining Centrifugally Placed

The lining of pipe with cement first came into prominence fifty or sixty years ago when wrought iron pipes used in water-works systems were coated with natural cement. Cement lining of cast iron pipe, so often discussed during this early period, was not extensively used until about 1922, when the centrifugal process of applying such lining was developed.

The method of applying cement lining to the interior of cast iron pipes consists of spinning portland cement onto a pipe by centrifugal force. The lining, because of centrifugal force, adheres very tenaciously to the inner surface of the pipe, is very dense, and has a hard, smooth surface. Pipe which is to be lined by this method does not receive the ordinary tar dip, and the cement lining is applied directly to the clean casting. After lining, the exterior of the pipe is coated with a tar or asphalt coating brushed or sprayed on.

Several series of tests have been made on cement-lined cast iron pipe with various velocities and with diameters of from 6 to 16 inches, and the average value of the Hazen-Williams coefficient "C" was found to be between 145 and 150, based on the actual net diameter after lining. It is

found that the decrease in friction more than offsets the reduction in diameter due to the cement lining.

The proportion of materials generally specified for the preparation of cement lining is one part of clean screened sand to three parts of portland cement by volume. Only sufficient water for depositing and proper distribution in the pipe should be used. The pipe is cleaned of all foreign matter and hydrostatically tested before the lining is applied. The lining should be applied centrifugally, the pipe being revolved at a peripheral speed of 300 feet per minute.

The standard average thickness of cement lining for pipes from 4 inches to 24 inches in diameter varies from 1/16- to 3/16-inch, being 1/16-inch thick for 4- and 6-inch pipes, ⅛-inch thick for 8-, 10-, 12- and 16-inch pipes, and 3/16-inch for 18-, 20- and 24-inch pipes. The usual precautions in the curing of cement mortar must be taken.

In recent years much investigation has been given to the preservation of the inside of concrete sewers and the possible effect of acids or other eroding characteristics of the sewage upon the concrete. In many cases, the use of either an asphalt or a Bitumastic lining has been resorted to, to prevent such possible disintegration of the concrete.

If this provision is a wise one, it seems rather incongruous to depend upon a thin layer of cement on the inside of cast iron pipe used in sewerage works, for the purpose of maintaining a high frictional coefficient, when there is a possibility of this coating's being destroyed or affected by the eroding substances in the sewage, and for this reason the use of Bitumastic lining is to be preferred to cement lining for sewerage work.

Recent quotations on the cost of cement lining per foot are as follows:

Size	Cost of Cement Lining per Foot in Place
4-inch	0.05
6-inch	0.06 2/3
8-inch	0.09½
10-inch	0.13
12-inch	0.17
16-inch	0.19
20-inch	0.25
24-inch	0.35
30-inch	0.50

Bitumastic Lining Centrifugally Applied

Bitumastic enamel is a solid material which is melted to a liquid consistency for purposes of application. It is manufactured from a purified coal tar base, and other ingredients, such as gums and fillers, are added to the coal tar base in the proper proportion to provide qualities in a satisfactory pipe coating.

Bitumastic solution is a liquid which is applied cold and used as a priming coat for the enamel. The solution is also prepared from a purified coal tar base, and other ingredients are added to provide the necessary characteristics for the purpose for which it is used. This solution is used mainly as a priming coat when the enamel is applied by hand, and is not required when the enamel is applied centrifugally; being replaced, in this case, by a bath of specially selected tar.

Bitumastic material has been used for many years for the protection of metal surfaces against corrosion, being first employed as a protective coating for steel vessels some 45 years ago, and it has been frequently specified by many engineers for protection for steel pipe lines against corrosion and tuberculation. Several forms of this material have been developed for a variety of specific purposes, and the practice, until a very recent date, has been to apply the material by hand brushing.

The introduction of a suitable mix and a process for the centrifugal application of this enamel makes this type of lining applicable to cast iron mains, and inasmuch as it combines the double advantage of providing a protective coating, and also a particularly smooth interior surface and consequent high carrying capacity, this lining is of particular interest to those engaged in water-supply management. The application by hand to small pipe was particularly difficult, expensive as compared to dipping, and the smooth surface now obtained by the centrifugal process was impossible to attain.

The method of applying the Bitumastic enamel lining is generally similar to the method used in recent years for applying a cement lining centrifugally. The pipe is carefully cleaned, heated and dipped in a suitable bath of selected tar priming coat. The pipe is then set on rollers and rotated during the application of the enamel lining. A long trough of semi-circular shape, containing the enamel in a hot and fluid condition, and in sufficient quantity to furnish the required thickness of lining, is inserted into the pipe and dumped, while the pipe is being rotated at the proper speed. After a short period of rotation the lining cools, and a heavy coating of whitewash is applied to the exterior surface of the pipe, in order to reduce the heat absorption capacity of the casting when later exposed to the sun.

As with every new departure from current practice, it is impossible to foretell the probable life of the material, and how long the initial smooth interior will stand up. However, the material in itself has a good record as a protective coating and there seems to be every justification to anticipate equal, if not better, results when the material is mechanically applied.

As is the case with the development of any material or process, certain difficulties have arisen. For instance, when first used, it was found that when lead was employed as a jointing material, the extreme heat of the lead raised the temperature of the pipe immediately under the pouring gate, so that the Bitumastic lining at the top of the pipe under the gate was softened to the extent that it sagged away from the pipe. A change in composition was made and the melting point of the material was raised to overcome this difficulty.

It has been found that the heat of Leadite or Lead-Hydrotite is so much lower than the heat of the lead, that this difficulty has not arisen where these lead substitutes were used for the jointing material.

Another difficulty in connection with the use of the lining is that at the present time slight changes of the composition of the lining must be made by the manfacturer to meet atmospheric temperatures prevailing in summer and winter. The temperature range of the material is such that if the upper light is adequate to withstand extreme summer heat, difficulties from checking may arise in cold winter months in a climate where the range in temperature is considerable. It is accordingly necessary to manufacture the pipe and install it during the same season.

Experiments are now well under way involving a modification of the composition of the material, so that one class of material will be adequate throughout the entire temperature range, and this precaution will then be unnecessary.

The Coefficient to Be Expected with Enamel Lining

Bitumastic enamel lining, when centrifugally applied, has a particularly smooth and glossy surface, giving the appearance of black porcelain.

While no tests are available showing coefficient values after Bitumastic lining has been in place for any great length of time, it is known that a large water main in New York City, coated with Bitumastic material, applied by hand some eighteen years ago, was found, upon emptying the line, to be in practically as perfect condition as when the material was first applied. Bitumastic material was also used on the gates of the Panama Canal locks and on the penstocks, and after thirteen years' service this material was found to be in perfect condition, requiring no recoating. These instances indicate that the initial high coefficient will be sustained after a considerable period of service.

An interesting test was made on a section of steel pipe 11 inches in diameter and 1,000 feet in length, which was laid on piers particularly for test purposes. The pipe was Talbot lined—a lining which is so similar in surface appearance to the Bitumastic lining that similar coefficient values can be reasonably expected. Several tests of this particular lining conducted with all possible accuracy, with the head measured by mercury manometer, and the flow measured by pitometer, gave an average value of C = 161.2.

Outline for Specifications

The high points of a specification for Bitumastic enamel lining for cast iron pipe include the following provisions:

1. Clean castings before coating.
2. Especially selected tar dip.
3. Enamel centrifugally applied in a molten condition to the cold pipe, while the pipe is being revolved at a proper peripheral speed to produce smooth, uniform lining throughout the length of the pipe. The quantity applied to the pipe to be such in amount as to provide a lining of 3/32-inch thickness with 1/32-inch tolerance for all sizes of pipe.
4. Outside coating of whitewash. Immediately after or during the lining process the external surface of the pipe shall be given a heavy coating of whitewash to lower the heat absorption capacity of the black exterior of the pipe.
5. The consistency of the enamel should be such as to withstand the range in temperature to which it is to be subjected, both while being exposed to the sun, and from heating in the vicinity of the joint while the jointing material is being poured, and the lining shall not run or sag at high temperatures nor crack at low temperatures.
6. Precautions should be taken in shipment to protect the lined pipe from hot cinders by covering the ends of the pipe by a tarpaulin.

CAST IRON PIPE LINED WITH BITUMASTIC ENAMEL APPLIED BY THE CENTRIFUGAL PROCESS AND COATED ON THE OUTSIDE WITH WHITEWASH TO REFLECT SUNLIGHT AND HEAT

Cost of Lining

The cost of lining is comparatively small in relation to the total cost of pipe line installation.

Diameter	Cost per Lineal Foot in Place
4-inch	$0.060
6-inch	0.076
8-inch	0.114
10-inch	0.156
12-inch	0.204
16-inch	0.288
20-inch	0.300
24-inch	0.420
30-inch	0.600
48-inch	1.000

The percentage of cost of lining to total cost of the material and labor involved in installing a pipe line will, under average conditions, vary from 3½ to 4½ per cent.

Conclusion

In concluding this discussion, the author cannot refrain from citing a recent experience in specifying Bitumastic lining. It was found that its use would have to be confined to the product of one manufacturer, and that any other pipe company would be forced to ship their pipe to the shop of their competitor for lining. The development of a satisfactory Bitumastic lining by other companies is one means of forcing a change in this situation, and I understand that several other pipe companies are equipping their plants to furnish Bitumastic lined pipe.

ACKNOWLEDGMENT.—From a paper read before the Thirteenth Texas Water Works Short School, Waco, Texas.

How Lakewood Won the Grand Prize in the Inter-Chamber Fire Waste Contest

By **RUSSELL FREY**
Executive Secretary,
Lakewood Chamber of Commerce,
Lakewood, Ohio

PREVENTING fires has cast off the swaddling clothes of an experiment. In almost every city and town in the United States it has become an accepted method of reducing fire losses. It has become so practical that business men and citizens now see that fire prevention means the saving of life and thousands or millions of dollars of property from destruction.

Lakewood has reached such a point in this work that its citizens may be said to have become "fire prevention conscious." The Lakewood program is unique in that it has been based largely on educating school children to be "fire cautious."

It has been found out that greater results can be obtained with parents by having their children carry home fire prevention ideas than by attempting to educate the parents directly. When little Johnny takes home an inspection blank from the teacher, his mother and father help him fill it out, answering questions as to whether there are any fire hazards in his home. Thus the parents and other members of the family are educated in the value of using more precaution in the prevention of fires.

The School Program

In the first eight grades of the public and parochial schools, at least once a week throughout the school year, teachers in each class are provided with an instructive lesson sheet which contains fire prevention information. The children are encouraged to write essays, verses, original playlets and songs and to draw posters on the general subject of fire prevention. Some original work is constantly being done by these students throughout the school year.

WORKERS FOR THE "FIRE-SAFE CITY"
The group in the center is, left to right, Secretary Russell Frey; Lakewood Assistant Fire Chief Donnelly; Mrs. Anneshansley, Assistant State Fire Marshal; "Smoky" Rogers; Virgil W. Souders, of the Ohio Fire Prevention Association, and Fire Chief J. H. Speddy

At least once a month and sometimes more often, fire drills are held under the supervision of the Lakewood Fire Department, and a careful record is made of the time that it requires all the students to make an exit from each school building. These are compared and a standard is set up for each school.

During National Fire Prevention Week special programs and mass meetings of students are held in all the schools, at which fire prevention demonstrations are made by members of the Fire Department and other officials. Of course the program of this week is always planned to be the high point in fire prevention activities, and the students look forward to it each year with increasing interest.

From time to time classes of students are taken to the nearest fire station, where they see at first hand the inner workings of the Fire Department.

Prevention in the Home

Throughout the year special emphasis is placed on the use of naphtha and other highly inflammable cleaning fluids, and in keeping clean the basements, closets, and attics in the home of the students. It is not an unusual occurrence for a girl to go home from school and tell her daddy that he must clean the flues in the spring.

"Daddy, the teacher said that we should not have any piles of waste paper in our basement," and

"Mother, the teacher said you shouldn't keep your oily dust mop in the house."

"Where shall I keep it, daughter?" the mother may ask.

"Well, the teacher said you should keep your dust mop out on the porch, or if it must be kept in the house, it must be placed in a bucket, so it will not catch on fire."

Lakewood's Record

The wisdom of these methods is shown by the fact that the Lakewood Chamber of Commerce won the Class 4 Award in the Inter-Chamber Fire Waste Contest for the years of 1928 and 1929 by presenting the best report of fire prevention accomplishments in its class of cities, ranging in population from 50,000 to 100,000. In 1930 its report won not only the Class 4 Award but also the Grand Prize for all classes of cities in the United States.

The effectiveness of the Lakewood program in preventing fires is indicated by the following record of fire losses:

Year	Property Loss	Loss per Capita
1924	$62,141	$1.13
1925	24,207	.42
1926	24,101	.39
1927	29,754	.48
1928	28,611	.42
1929	65,392	.93
1930	18,668	.26

The Lakewood program does not in any way overlook the valuable work that can be done by clubs, churches and other organizations in the city. This work has been most exacting and thorough.

Inspection and Publicity

Inspection of all business buildings as well as apartments is conducted monthly by the local Fire Department. A detailed record is made and building owners are urged to comply with recommendations in eliminating fire hazards. Prevention of fires has become so widely accepted in Lakewood that compulsion is a rarity. Enforcement of recommendations when elimination of fire hazards is not voluntary, is the responsibility of the City Building Department.

The Fire Prevention Committee acts as a clearing-house agency in encouraging the various clubs and agencies to carry on fire prevention activities. It is composed of citizens in several walks of life and officials of the schools and Fire Department.

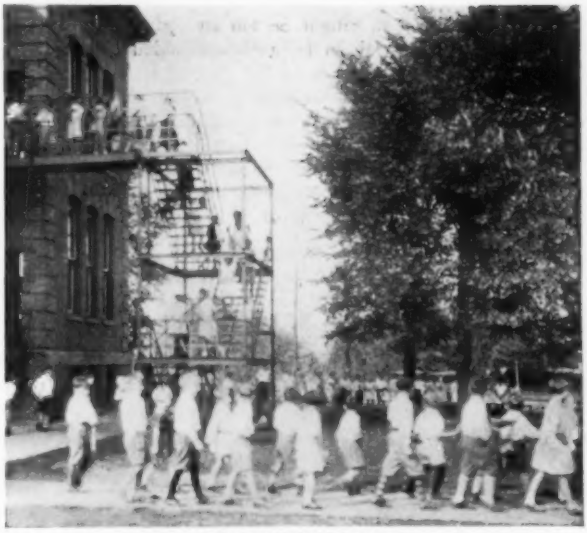
A very important part in the Lakewood program is the amount of publicity given to the prevention of fires. The idea of preventing fires by eliminating all opportunities for them to get started is kept frequently before the public by means of newspaper articles calling attention to dangerous hazards.

Other Activities

The City Building Code, which was adopted in 1921, is now in process of revision. A committee of the Lakewood Chamber of Commerce has been cooperating with the City Council in bringing the Code up to date in accordance with the new standard specifications of the National Board of Fire Underwriters.

The recent action of the city government in starting the construction of an incinerator is considered an important forward step in fire prevention. This will provide means for burning combustible rubbish which accumulates in homes and buildings and often causes dangerous and costly fires.

The delegation of twenty-one business men who journeyed to Washington in May, 1930, to receive the Class 4 Award was an effective means of publicity. It helped to direct the attention of Lakewood citizens to the importance of fire prevention. A similar party of fifty Lakewood citizens this year will make the trip to Atlantic City to receive the Grand Award at the 19th annual meeting of the Chamber of Commerce of the United States (about to convene as this issue of THE AMERICAN CITY is being printed).



SCHOOL FIRE DRILL

The Lakewood Fire Department under Chief J. H. Speddy in 1930 played a most important rôle in the organization and sponsoring of the first Ohio Fire School at Ohio State University. The Department put on all the demonstration during the school.

These are only a part of the activities of the Lakewood program; to mention and describe them all would take more space than has been allotted to this discussion.

In carrying out a fire prevention program, active cooperation must always be received from the mayor, city council, fire department, and officials of the public and parochial schools. To obtain such cooperation, these officials must be shown the importance of educating the citizens in the value of fire prevention. Here is an opportunity for important public service by chambers of commerce.

Highest Standards of Enduring Architecture Urged for Public Buildings

AS a climax to three days of discussion, showing that the architectural profession is thoroughly aroused over the tendency to concentrate architectural service for public buildings in the hands of governmental bureaus, the American Institute of Architects, at its sixty-fourth convention at San Antonio, Texas, April 16, 1931, adopted the following resolution:

"The American Institute of Architects affirms that the public buildings and monuments in every community of the nation should proclaim the highest standards of enduring architecture, and that in their design the customs, traditions and local materials of the community in which they are located should be fully recognized.

"The Institute further affirms that such standards of excellence can be achieved only by enlisting the services of the best ability in the architectural profession that is locally available, and that every community is entitled to such services.

"It also affirms that men capable of producing these results are not to be found in subordinate capacities in state, municipal and other civic planning bureaus, and that the concentration of planning and designing buildings in such bureaus must inevitably tend to produce stereotyped, mediocre, uneconomic and uninspiring results.

"The Institute further believes that a national policy of encouraging private business initiative is wise, and that therefore the operation of state, municipal and other bureaus for the designing of buildings and monuments is inconsistent with this policy and an invasion into the field of individual professional activity.

"In urging upon state, municipal and civic authorities the desirability of availing themselves of the services of architects in private practice, the Institute stresses the importance of the care which must be taken in their selection. That they should be chosen for reasons of fitness alone, and on the

basis of their records, cannot be too strongly emphasized.

"The Institute through its delegates assembled directs Chapters to transmit these views to the proper state, municipal, and other civic authorities in their communities, and to take such other measures in cooperation with related organizations as may be necessary to accomplish the aims expressed herein."

Another important action by the convention was the adoption of the report of the Institute's Board of Directors, in which the early establishment of a Federal Department of Public Works was advocated. This new Federal agency was urged in order that all government construction agencies shall be efficiently correlated under one executive head, presumably of Cabinet rank; with two assistant secretaries, one in charge of engineering projects, the other in charge of architectural projects. The function of this Department should be solely administrative and supervisory. In this way only can the best engineering and architectural ability of the country be made available for public works.

Salary Expenses and Other Official Data for Cities and Towns of Massachusetts—1930

THE following table, in two parts, was compiled by C. A. Bingham, Town Manager of Norwood, Mass., to gather together information on salaries and expenses, and other statistics for the 31 cities and towns in Massachusetts of 12,000 to 22,000 population (1930 census). The data were checked by officials in each municipality. Salaries of treasurers, collectors, city and town clerks and accountants or auditors are not given, because, it is stated, nearly every community seemed different as to whether each office was separate or combined in various ways. The table is dated March 20, 1931.

NO.	CITY OR TOWN	POPULATION	AREA	CHIEF OF POLICE	CAPTAIN OR LIEUTENANT	SERGEANTS	PATROLMEN (MINIMUM)	PATROLMEN (MAXIMUM)	SERVICE FOR MAXIMUM	TOTAL POLICE FORCE	* DESIGNATES PART TIME	FIRE CHIEF	DEPUTY CHIEF	CAPTAINS	LIEUTENANTS	FIREMEN (MINIMUM)	FIREMEN (MAXIMUM)	SERVICE FOR MAXIMUM	TOTAL FIRE FORCE	CALL FORCE AND SALARIES	DAYS OFF	ASSESSORS SALARIES	COUNCILMEN OR SELECTMEN SALARIES	SOLICITOR OR COUNSEL
NO.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
1	ADAMS	12,697	23	2500	1-2002 1-1924	NONE	1820	1870	NONE	12	→	ALL	VOLUNTEER		FORCE	OF		40	NO PAY	→	—	2000, 1100 AND 800	1-500, 2-400	1200
2	ATTLEBORO	21,769	27.5	2300	1-1950	2-1890	1642	1825	1YR	25	2500	2400	3-2007	5-1916	1642	1825	1YR.	46	10 CALLMEN	2 PLAT	1-2000, 2-1500	11-300		1000
3	BELMONT	21,748	4.6	3200	NONE	3-2400	1900	2200	4YRS	30	3200	2500	5-2400	NONE	1900	2200	4YRS	30	6 CALLMEN	2 PLAT	CHMN 1000 CLK. 750. 1-600	CHMN 825, 2-625		4535 NO FIXED SALARY
4	BRAINTREE	15,712	13.7	3000	NONE	3-2100	1700	2000	5YRS	15	3000	2375	2-2200	3-2100	1700	2000	5YRS	10	25 CALLMEN	1 IN 5	3-1000	3-850		700
5	CLINTON	12,817	5.4	2106	NONE	1-1789	1638	1638	NONE	8	→	CALL	→	1-1924	NONE	1824	1824	NONE	9	39 FROM 200 TO CHIEF 350	1 IN 3	2-1200, CLK. 1500	1-300, 1-200, 1-100	1200
6	DANVERS	12,957	13.6	2300	1-1925	1-1875	1825	1825	NONE	9	2510	→	CALL FORCE	→	1825	1825	NONE	11	35 FROM 200 TO 300	1 IN 4	CLK 1200, 2-900	1-500, 2-400		1200
7	DEDHAM	15,136	10.5	3000	1-2600	1-2300	1900	2100	5YRS	15	3000	→	CALL FORCE	→	1900	2100	5YRS	15	CALL FORCE	2 PLAT	CHMN 1200, 2-1000	CHMN 800, 2-600		1650 NO FIXED SALARY
8	FRAMINGHAM	22,210	23.9	3000	1-2500 1-2325	1-2200	1700	2000	3YRS	24	2400	2200	3-2000	4-1950	1600	1900	3YRS	42	NONE	1 IN 6	CHMN 2600 1-1700, 1-900	3-666.66		1200
9	GARDNER	19,399	22	2100	1-2000	NONE	1825	1825	NONE	14	3000	NONE	2-1916	NONE	1825	1825	NONE	14	48 FROM 200 TO 210	—	CLK 2000 CHMN 700, 1-650	11-200		2000
10	GREENFIELD	15,500	21.5	3000	NONE	1-2340	1820	2184	1YR	14	* 1000	→	ALL CALL FORCE	→	1950	1950	NONE	4	DEPUTY CHIEF 250 MEN 75¢ PER HOUR	—	3-1200	1-900 1-600, 1-500		1200
11	LEOMINSTER	21,810	28.8	3000	2-2007	NONE	1825	1825	NONE	13	2200	—	1-2007	1-2007	1825	1825	NONE	19	38 CALLMEN	2 PLAT	CLK 2300 CHMN 1500, 1-600	9-250		2000
12	MARLBORO	15,587	21	2500	1-2300	NONE	1825	2007	6MO.	16	* 800	ALL	CALL FORCE		—	—	—	9	41 FROM 200 TO 225	1 IN 3	CHMN 1000, 2-700	11-200		1500
13	METHUEN	21,069	22.4	2600	3-2145	NONE	2007	2007	NONE	16	* 1200	2293	3-2145	2-2080	2007	2007	NONE	24	CALLMEN 60¢ PER HR	2 PLAT	CHMN 2000, 2-1900	1-600, 2-500		1200
14	MILFORD	14,741	14.8	2400	NONE	NONE	1820	1820	NONE	9	→	ALL CALL FORCE	→	1820	1950	ON CHEM.		4	CALLMEN 200 TO 250	—	CLK 1500, 2-1000	3-250		250 (EXTRA SERVICES 941)
15	MILTON	16,434	13.1	3000	1-2625	3-2400	1800	2200	4YRS	31	3000	2625	NONE	3-2400	1900	2200	3YRS	21	15 CALLMEN 125 TO 262	2 PLAT	CHMN 1200, 2-800	3-500		2000
16	NATICK	13,589	14.9	2350	NONE	2-2200	1800	2000	5YRS	15	2500	2000	1-1950	NONE	1650	1900	3YRS	17	20 CALLMEN 150	1 IN 3	CHMN 2600, 2-1300	1-500, 2-400		1000
17	NEWBURYPORT	15,084	8.3	2200	1-2080	NONE	1820	1820	NONE	14	→	ALL CALL FORCE	→	1560	1820	—		13	30 FROM 150 TO CHIEF 500	1 IN 7	3-1400	NOTHING		700 (PLUS EXTRA)
18	NORTH ADAMS	21,621	20.6	2600	2-2100	NONE	1733	1516	2YRS	23	2600	2100	NONE	NONE	1733	1916	2YRS	26	11 CALLMEN 65 TO 100 10 EXTRA @ 10	2 PLAT	CHMN 2400, 2-1000	NOTHING		1100
19	NORWOOD	15,049	10.5	3300	NONE	3-2400	1600	2100	5YRS	20	2800	2360	→ CALL	→	1600	2100	5YRS	12	18 CALLMEN 200 TO 290	1 IN 5	CHMN 2000, 2-600	NOTHING		2000
20	PEABODY	21,345	16.4	2500	1-2200 1-2100	NONE	1825	1825	NONE	23	2500	2200	4-2007	NONE	1825	1825	NONE	26	40 CALLMEN 250 TO 300	1 IN 5	CHMN 2000 CLK 2200, 1-1500	11-250		2500
21	PLYMOUTH	13,042	97.6	2500	1-2080	NONE	1638	1950	4YRS	11	2750	2366	1-2054	NONE	1664	1950	5YRS	12	35 CALLMEN	1 IN 6	3-1600	1-1200, 4-150		(AVER 1200)
22	SAUGUS	14,700	10.6	2600	1-2300	NONE	2007	2007	NONE	11	2600	NONE	1-2300	2-2100	2007	2007	NONE	12	10 CALLMEN 150	1 IN 5	1-500, 2-300	3-200		600
23	SOUTHBRIDGE	14,264	20.4	2400	NONE	NONE	1872	1872	NONE	13	2400	NONE	1-2048	—	1872	1872	NONE	7	25 CALLMEN	1 IN 14	3 AT 966.66	1700 TOTAL FOR 3		800
24	WAKEFIELD	16,318	7.3	2750	NONE	2-2372	2008	2190	2YRS	14	2750	NONE	2-2250	2-2265	2008	2190	2YRS	14	30 CALLMEN 200	2 PLAT	CLK 1500, 1-850, 1-750	5-100		1000
25	WEBSTER	12,992	12.5	2600	1-2080	1-1950	1820	1820	NONE	8	* 1000	ALL	CALL FORCE	—	—	—	—	—	175 TO 210 YR.	—	CLK 1500, 1-800, 1-750	3-350		1000
26	WESTFIELD	19,775	46.9	2500	1-2232	3-2170	1820	2002	6MO.	21	2500	2-2170	→ CALL	FORCE	→	1638	2002	6MO.	20	31 CALLMEN 150	2 PLAT	CHMN 1800 CLK 1700. 1-600	11-150		500
27	W. SPRINGFIELD	16,684	16.8	3200	1-2500	3-2242	1872	2093	5YRS	18	2600	2417	2-2302	2-2197	1872	2093	5YRS	22	— — — —	2 PLAT	CHMN 1800, 2 @ PER DAY	CLK 2000 1-1000, 1-900		(150 PLUS EXTRA SERVICES
28	WEYMOUTH	20,882	16.7	3150	1-2550 1-2300	3-2100	1825	2050	[illegible]	28	2500	2080	4-2080	4-1950	1560	1820	1YR.	23	32 CALLMEN 25 YR. AND 1 PER HR.	1 IN 5	CHMN 2200, 4-800	CLK 1800 1-800, 3-700		1500 (EXTRA SERVICES 1160)
29	WINCHESTER	12,719	5.9	3000	1-2600	5-2400	1820	2190	1YR.	16	3000	2300	1-2200	NONE	1825	2100	1YR.	16	20 CALLMEN 200	1 IN 3	CHMN 1000, 2-900	NOTHING		1500 (EXTRA SERVICES 1295)
30	WINTHROP	16,852	1.6	2382	1-2182	2-2105	1600	2097	5YRS	17	→	ALL CALL FORCE	→	1600	2008	5YRS		10	35 CALLMEN 1 PER HR	1 IN 6	CHMN 2000, 2-600	CHMN 300 2 AT 250		1500
31	WOBURN	19,434	12.9	3065	1-2372	3-2287	2190	2190	NONE	17	2865	—	3-2372	2-2281	2065	2190	1YR.	22	21 CALLMEN	2 PLAT	CHMN 2500, 1-1000, 1-700	NOTHING		1000
	AVERAGE PER CITY	16,901	10.9	2700	2228	2187	1816	1978	—	17	2689	2285	2122	2113	1793	1972	—	17	27 CALLMEN	1 IN 5	AVERAGE FULL TIME MAN-1808	—		1464
	AVERAGE PER CAPITA									1 TO 1008 POP.								1 TO 277 POP.						

NOTES.—*Adams:* Including $22,000 hospital appropriation. This town operates certain activities under a "Fire and Water District." *Clinton:* 1930 debt payment includes $175,000 paid on sinking-fund. *Danvers:* $17,000 water bonds under bond payment, but $15,699 interest under water operation. *Framingham:* Sewer Superintendent, $2,340. *Gardner:* Fire-hydrant charge includes all public use of water. *Methuen:* Highway construction and maintenance not always segregated; figures shown are as correct as possible. *Westfield:* Superintendent of Fire Alarm also a fireman. * Part time.

Satisfaction and Dividends from Modern Housing Developments

THAT high-grade, large-scale, low-cost housing enterprises can be made a safe investment while performing a most important social service is indicated by recent reports from the Michigan Boulevard Garden Apartments, of Chicago, and the Brooklyn Garden Apartments, in New York.

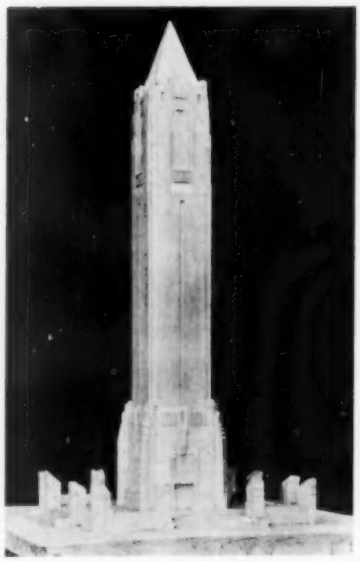
The building corporation of the Chicago development, financed by Julius Rosenwald for negro tenants, reports as follows:

"The net profit for the year amounted to approximately 5 per cent on the common stock outstanding on December 31, 1930, after full allowance had been made for operating expenses, interest, taxes, insurance and depreciation. The average occupancy for the year was 97.5 per cent. Loss arising from apartment bad debts amounted to 1.2 per cent of the total rental income. Collections are being made on this account which will further reduce the percentage of loss."

The Brooklyn Garden Apartments, Inc., which last year paid a 5 per cent dividend, has this year increased the rate to 6 per cent, the limit permitted by its charter. A letter to stockholders, signed by Louis H. Pink, President, and Walter Kruesi, Secretary-Treasurer, states that the books show that the dividends have been earned with a reasonable margin after payment of mortgage installments and other reserves, in spite of the fact that the second of the two garden apartments erected by the company was finished and productive for but two months of the last fiscal year. The letter adds:

"Our houses are full. We earned the full dividend out of rents lower than the law requires. . . . The success of our company demonstrates that the building of model tenements under the State Housing Law can be a safe, conservative business, as well as a community benefit. Our new houses are the only development under this law which has torn down old and unfit houses, and though this added to the land cost, our experience indicates that these units will earn enough to pay 6 per cent on their cost. . . . The building of these apartments offers a practical means of providing employment. For every dollar of capital stock subscribed, three dollars can be spent locally for land, labor and materials."

Jones Beach State Park



THE WATER TOWER

A Seaside Resort Where Recreation Planning Is Carried to a Nwe High Level of Beauty as Well as of Efficiency

JONES BEACH STATE PARK, one of the largest and most recent undertakings of the Long Island State Park Commission (New York), is something new in a water front recreation resort. It is moreover a striking demonstration of the extent to which a state may exercise generosity, imagination, and a sense of beauty in providing for the leisure of the masses of its people.

As lately as 1927, the park site was a bleak, windswept reef of well over 1,000 acres, with a sparse growth of seagrass and dwarfed shrubs, and a huddle of summer shacks. It was the last large undeveloped ocean frontage of the region and had long remained so because it was accessible only by boat. When, on August 4, 1929, it was officially opened as a playground, it had been linked onto the Commission's marvelous system of developing parkways over Long Island by a new stretch of parkway 400 feet wide built on a causeway extending 5 miles from the mainland. Dunes had been leveled, miles of snow-white beach had been built up with sand from the ocean bottom. The casino shown below had been built, providing accommodations for 10,000 bathers, and there were concrete parking areas for 12,000 cars. Development of land and buildings had been carried on simultaneously with the building of the causeway (with all materials transported by boat), and has been carried on on a year-round basis ever since.

The distinctive features of the whole development—aside from the quality and scale of the recreation provided—is the architectural harmony of the buildings. This extends even to the smallest service accessory. All building and landscape plans, as well as layouts for active play areas are drawn by the Commission's own engineering staff, by whom the whole plan has been originated. That harmony of color as well as of design prevails throughout the development is due to the fact that a full-time member of the staff does nothing but color

THE CASINO, KNOWN AS PAVILION NO. 1

A glimpse of the canopied sun-deck is shown, and some idea is given of the landscaping, the fencing such as is used throughout the development, and the concrete waste containers

planning.

Building materials used throughout are pink Barbizon brick in combination with Briar Hill sandstone of soft amber yellow. There are enlivening touches of vivid hue—blue here, green there. The landscape design is developed chiefly through use of pink petunias and green shrubs, profusely planted. Buildings and grounds; the dazzling white of the sand; the intense blue of sky and sea; the deep orange of beach umbrellas form a splendidly patterned background for the animated pageant of bathers and others, gay in sea attire.

The 200-foot water tower closes the vista down the causeway from the mainland and contributes the dominant architectural note. It is of pink brick. The sculptured base is by Ulric H. Ellerhusen. The roof is vivid blue-green copper. Beacon-lighted, and floodlighted from pinnacle to basement, it is visible at night for a distance of 25 miles. Its length is mirrored in flanking, elongated panel pools, flower-bordered, that are the principal features of the surrounding landscape plan.

Complete Equipment

The two bathhouses have been called the most attractive structures of their character on the Atlantic Coast. They are broad and low, distinctly modern, and strikingly fresh and vigorous in treatment. The casino faces on the Ocean Parkway, and is a quarter of a mile from the tower. In addition to bathing facilities and sun-decks, it has a restaurant and soda fountain, specialty shops and the administration offices, all of which will be moved to the new building being completed for the 1931 season. This structure is similar to the first. The central feature of its design, however, is a large double swimming pool, enclosed but roofless, of concrete lined with white tile. The pool proper is 150 by 100 feet; the children's pool adjoining it, but entirely separated from it, is 100 by 50 feet. Over 2,000 dressing rooms and 3,000 steel lockers are provided. The salt water from the pools will not be pumped directly from the ocean. The Commission has driven wells beyond the high-water line. Water from these will be filtered through sand to the pump points, raised to the surface, refiltered and chlorinated before entering the pools. The pool water will be changed every few hours by the recirculation system to be used.

A large, three-level diving stand of circular design will be provided at one end of the pool, and the pool itself will be attractively illuminated by a novel system of under-water lighting. A tiled balcony surrounds the pool. Part is for spectators and the rest is a dining terrace. Three such terraces, on two levels, accommodate 300 people each, and are extensions of the large black-and-gold restaurant where 500 people may dine with unobstructed view of the ocean.

In addition to the five miles or more of ocean beach, a still-water bathing area, with a 3,000-foot crescent of white sand, has been developed on a landlocked bay some 300 yards from the ocean. The bathhouses are conveniently located to serve this. There is an exceptionally large diving platform 125 by 15 feet, with six low diving boards and two 10-foot diving towers. All sorts of aquatic sports have been developed here. There is a yacht harbor; also a boathouse. The entire bay is circled by 600 candlepower lights, placed at 100-foot intervals.

PARK AND PARKWAY BRIDGES AND SIGNS

This grade separation on the Southern State Parkway, by which motorists reach Jones Beach, is typical of numbers of overpass bridges throughout the parkway system. The vistas through the Japanesque bridge arches add to the charm of the landscape. The metal silhouette signs are extensively used at Jones Beach

A marine boardwalk three-quarters of a mile long, joins the two bathhouses, and is lighted by ship-deck lanterns fitted to the ship's rail which borders it. Specially designed marine lanterns are used for all ordinary outdoor lighting purposes. Seats, of which there are several hundred, are architecurally designed, of heavy board mounted on poured cement bases. Like the litter containers and other outdoor accessories, they harmonize with the decorative detail of the larger structures. Independent comfort station buildings, the new bus loading station and refreshment stand, the pergola-like entrances to the concrete parking areas with their shaded chauffeurs' rest—even the fencing and light posts and the direction signs, have all been developed for a maxi-

ONE OF THE CONCRETE PARKING LOTS

This shows a few of the quarter-million cars parked at Jones Beach during last summer

mum of service *plus* beauty and harmony.

Halfway between the two bathhouses a lower deck is being developed under the boardwalk and equipped for deck sports. Between the boardwalk and the Ocean Parkway are all manner of lawn sports. Farther along the beach are playing fields, and an 18-hole pitch and put golf course. Well-equipped playgrounds are provided to appeal to all ages, and there are three ingeniously designed miniature golf courses, all different, all homemade. A full-time recreation director is on duty during the season. There is an exceptional life-guard organization, and a college-boy patrol, under the State Police.

Although the beach is 35 miles from mid-Manhattan by motor and 6 miles by bus from the nearest railroad station, all facilities have been used practically to capacity since the opening, and as fast as provided. During the 1930 season, which extended from May 17 to September 3, there was a total attendance of 1,376,000 with 256,412 bathhouse patrons, and 223,945 cars parked. On July 27, one of the season's good days, there was an attendance of 75,000, with 13,550 bathhouse patrons and 10,015 parked cars, and 12,635 cars entering over the causeway. The Commission operates on a nominal fee basis all facilities except restaurants and specialty shops. Prices are 35 cents for a locker, 75 cents for a private dressing room, 50 cents for suits and 10 cents for towels. Parking charges are 25 cents on week-days and 50 cents on Saturdays, Sundays and holidays. Last year its gross income on these was $306,000. It expects to realize nearly double this amount this year.

The construction work of this development is a separate story, the operation another. But it is pertinent to ask in passing: How do the patrons react to an environment of such perfectly planned beauty? Don't the constant hordes tear the place to pieces and litter it with refuse? The answer is that not a petunia is picked, not a watermelon rind left around, and not a piece of equipment wilfully damaged. The Long Island State Park Commission, in thus demonstrating the influence of environment on public conduct, is following a principle which it has already proved in its other developments.

The System of Parks and Parkways

There is no other piece of recreation planning in the country that exactly parallels the state's system of parks and parkways developed or planned for Long Island. Under the aggressive leadership of Robert Moses, the whole vast plan has taken form since 1924. Arthur E. Howland is Chief Engineer, and Benjamin L. Van Schaick is Executive Secretary. Land has been acquired and developed; projects have been visualized and embarked upon that will take years to complete according to carefully devised financial programs.

The system includes 17 areas ranging in size from the 14 acres of Gardiner's Point to the 1,755 acres of Hither Hills; the whole comprising 15,000 acres. Each site has been selected for scenic beauty or play opportunities, or both. Most of the parks offer bathing; some of them both surf and still-water bathing. In one, at Valley Stream, there is a fresh-water lake where 5,000 to 8,000 persons may bathe at once. There are opportunities for picnicking, tennis, horseback riding and almost every form of active sport in the various areas, and camping in four. At one of these, Heckscher State Park, the dense woods are a game preserve and bird sanctuary.

The system of parkways being developed by the Commission will eventually relate the individual parks and make them more accessible to motorists. The 250-foot right-of-way parkway is attractively landscaped, with native growth conserved and other planting added. Innumerable delicately arched bridges, individually designed, of green-grey stone, with their approaches graded and planted, over-pass all cross traffic. Fencing guard-rails and light posts blend pleasantly into the scene. One of the most interesting features of the whole has been the cooperation of counties and municipalities.

THE OCEAN BEACH WITH BATHHOUSE 1 IN THE BACKGROUND

A Saturday afternoon or Sunday crowd of 15,000 gives no effect of congestion, so spacious is the beach, and so varied the attractions developed in conjunction with it

Fairchild Aerial Survey

A STRETCH OF THE CAUSEWAY

This air view gives a splendid idea of the approach to Jones Beach, which is a triumph of highway engineering. A 425-foot width has been sodded for the entire 5-mile length to deaden the glare of the white sand. The 500,000 square yards of concrete that has been used on the causeway was cured by the Hunt Process. The tower is at the junction of the causeway with the Ocean Parkway. The golf course, one parking lot, and the recreation areas close to Bathhouse No. 1 may be seen in the picture

Acme—P. and A.

A SECTION OF THE MARINE BOARD WALK

and a closer oblique view of the bathhouse unit shown above. The boardwalk has now been extended for a quarter of a mile

How Dunkirk Cleaned Up Its Front Yard

A New Lake Wall—An Intercepting Sewer—A Sewage Treatment Plant

By **FREDERICK K. WING, M. Am. Soc. C. E.**
President, Frederick K. Wing Co., Consulting Engineers, Buffalo, N. Y.

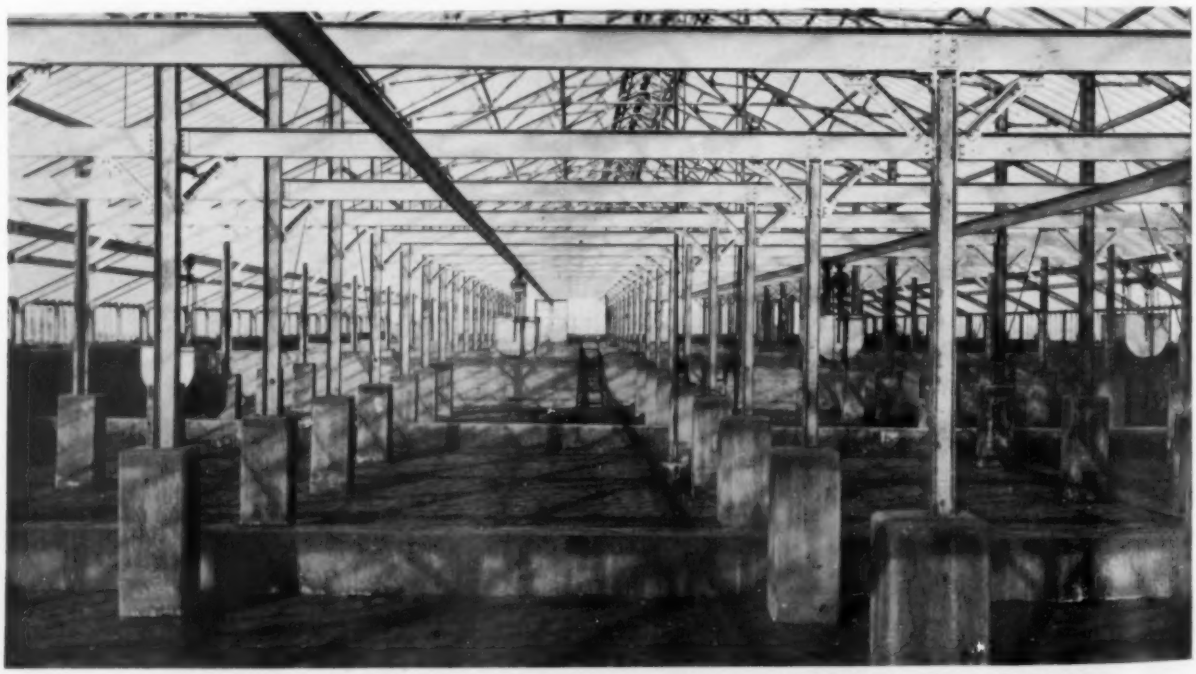
THE NEW LAKE WALL AT THE FOOT OF LEMING STREET, DUNKIRK, LOOKING WEST

RECENTLY Dunkirk, N. Y., has undertaken improvements involving the construction of a lake wall, an intercepting sewer and a sewage disposal plant. Previously the sewers of the city led down to and emptied on the lake beach. The improvement wrought by the change from this unsanitary and unsightly method to the system now completed can easily be imagined, and it is but the beginning of a complete renovation of the lake-front portion of the city, and of the institution of parks and boulevards along the waterfront.

In 1926 a campaign was started, sponsored by the Chamber of Commerce and the local newspaper, the *Dunkirk Evening Observer*, to clean up the beach along the harbor front. This culminated favorably in a taxpayers' election which provided a fund of three-quarters of a million dollars to carry out the improvement. In March, 1928, the City Council employed the Frederick K. Wing Co. to prepare plans for the improvement and to supervise its construction. Plans were made for an intercepting sewer to be built all along the lake front, 9,300 feet long, to collect the dry-weather flow from all the sewers emptying into Lake Erie. A lake wall, 7,200 feet long, was also planned, to protect this interceptor and to establish locations for a park and a boulevard along most of the lake front. And, finally, a sewage disposal plant was included in the improvement, located on the lake front in the northeastern part of the city, where the sewage was to be treated and emptied into the lake about a quarter of a mile out from the shore.

The Sewage Treatment Plant

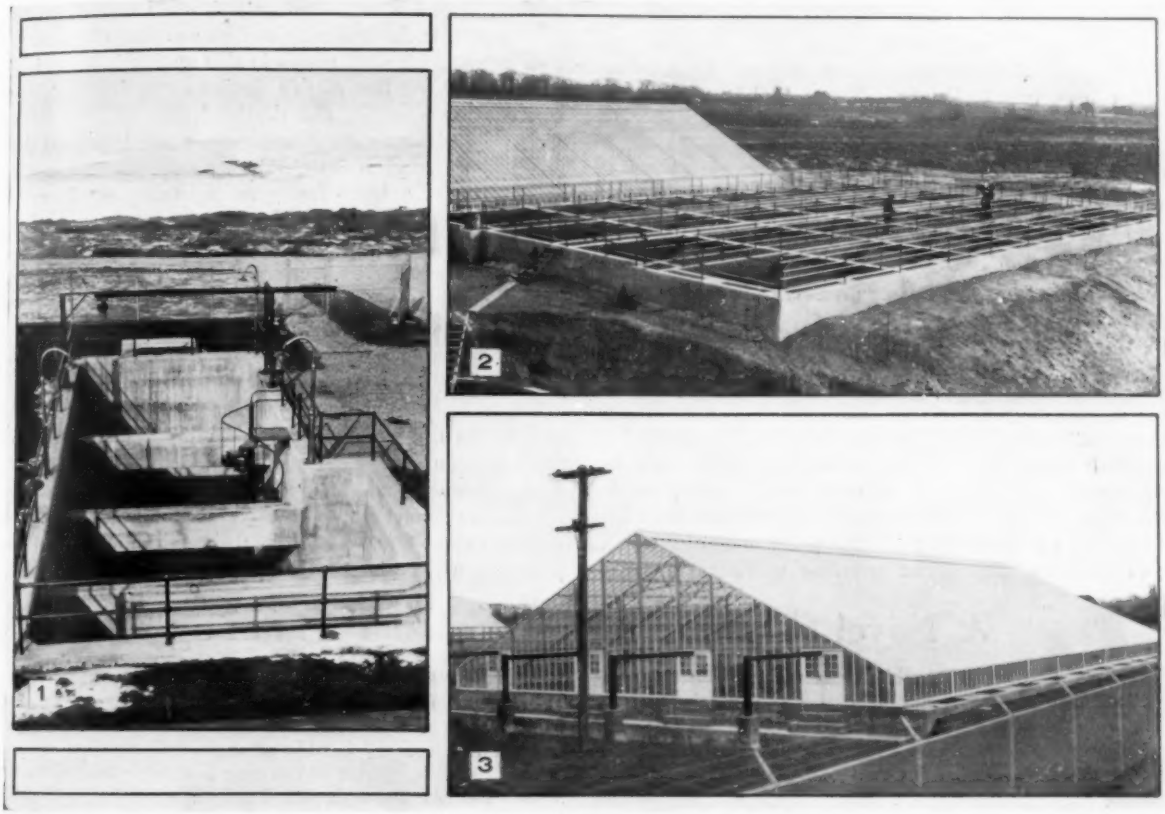
The construction work was started in December, 1928, by Moore Construction Co., Inc., of Buffalo, N. Y., a contracting firm which had built several sewage disposal plants. The work is now completed, and the interceptor and disposal plant have been in successful operation for the past six months.



INTERIOR OF SLUDGE BEDS NOS. 2 AND 3, SHOWING THE CONSTRUCTION OF THE GLASS-OVERS AND THE OVERHEAD MONORAIL SYSTEM FOR REMOVING THE SLUDGE

The excavation involved approximately 8,100 cubic yards of shale rock and 16,000 cubic yards of earth, all of which was done with a gasoline shovel and clamshell, after drilling and blasting the rock. The excavation for the Imhoff tanks was 18 feet in earth and 18 feet in rock. Small gasoline and electric pumps kept the excavation dry during construction.

The general arrangement of the disposal plant was such and is lifted 48 feet by pumps into the Imhoff tanks. The pumping station is equipped with four electrically driven non-clogging centrifugal sewage pumps, arranged to start and stop automatically according to the water levels in the sewage well. Two of the pumps have a capacity of 3.6 m.g.d., and two a capacity of 5.05 m.g.d. Space is also provided for two more pumps to be added when needed. The pumps are located in the basement of the pump sta-



THE DUNKIRK SEWAGE TREATMENT PLANT

1. The detritor as seen from the roof of the sewage pumping station. 2. The Imhoff tanks. 3. The glass cover for sludge bed No. 1

that all the concrete for the structures could be poured from a central tower by means of chutes, the concrete mixing plant being located underneath the tower. Combined aggregates were used, which were trucked from the city dock about a mile away. The trucks dumped into an Erie Aggremeter located over the ¾-yard concrete mixer.

The sewage disposal plant is at the present time fairly well isolated, being located on city-owned land, about 1,000 feet from the nearest residence. It is designed to serve a population of 30,000 persons, and the average flow of sewage was estimated at 150 gallons per capita per day. The maximum rate to be treated is 4.5 m.g.d.

Preparatory treatment consists of one 5-foot wide bar screen, with 1-inch clear openings, mechanically cleaned. This is followed by a 16-foot square Dorr detritor, to remove the grit and mineral matter. The grit and screenings are placed in cans, which are collected each day by the city garbage collector.

From the detritor the sewage flows into the sewage well tion at such a level as to be always primed. On its way to the Imhoff tanks, the sewage passes through a venturi meter which records the daily pumpage.

The two Imhoff tanks have a detention period of 2.5 hours, and a sludge digestion chamber capacity of 3 cubic feet per capita. They are also designed so that the flow may be reversed. They are provided with walks and protected with pipe railings, which facilitate scum removal and the cleaning of the tanks.

Next in the line of flow is the final settling tank, which has a detention period of one hour. The sewage is chlorinated as it enters this tank by means of three Wallace & Tiernan machines of the solution feed type, each having a capacity of 75 to 300 pounds of chlorine per day. The amount of chlorine is checked every 8 hours by the orthotolidin test for residual chlorine—a residual of 0.2- to 0.5-part per million being constantly maintained. The treated effluent then flows by gravity through the 30-inch cast iron outfall sewer about a quarter of a mile long, laid in a rock excavated trench in the bed of Lake Erie.

Sludge Handling

The sludge after being digested is removed from the Imhoff tanks by gravity and from the final settling tank by means of a sludge pump. It passes through 8-inch cast iron pipes and is deposited on the sand sludge drying beds. The area of the sludge beds receiving the sludge from the Imhoff tanks is based on 0.6-square foot per capita, which, in the case of Dunkirk, is 18,000 square feet. The area receiving the sludge from the final settling tank is 9,000 square feet. These beds are provided with especially designed American-Moninger glass covers. One glass house, 125 feet by 74 feet, covers a bed taking the sludge from one of the Imhoff tanks. The other glass house, 253 feet by 74 feet, covers two beds, one for the second Imhoff tank and one for the final settling tank. The sludge is removed by hand from the beds and placed in overhead Louden carriers of 25 cubic feet capacity, and these are pushed out of the houses over a driveway and dumped into trucks, to be carted away.

Intercepting Sewer and Lake Wall

The sewer system of the city is of the "combined" type. There were some twenty or more sewers that flowed into Lake Erie at the north end of their respective streets. The new intercepting sewer was built along the beach for about 4,300 feet of its 9,300 feet; the remaining 5,000 feet was built along Front Street, which is parallel with the lake shore. Near the end of each sewer leading to the lake a connection was built to the new interceptor. The connection was made in an intercepting manhole, which, besides having the regular overflow weir, has a grate-valve at the inlet end of the connecting sewer. This weir and valve were adjusted in dry weather to take about 200 per cent of the flow at that time.

The lake wall has an L-shaped section with a base slab of reinforced concrete 2 feet thick by 8 to 9 feet wide. On this slab at the lake side, the vertical section is built 6 feet high, 2 feet thick at the top and 3 feet thick at the base slab. This is also reinforced, the steel extending into the base slab. One section of the lake wall is set out in the lake and is supported on a line of Lackawanna steel sheet piling at the lake side and on wooden piles near the back of the base slab, which in this section is 9 feet wide. There are 2,300 feet of this section extending from Central Avenue westerly, and the land thus reclaimed from Lake Erie will provide, after filling, a city lake-front park of about ten acres in extent. The possibility of providing this park was a large factor in procuring the favorable vote on the bond issue. The other two sections of the lake wall rest directly on bedrock and extend from Washington Street easterly about 4,900 feet. Filling was placed behind these two sections of wall to form a boulevard along the lake front. A 2-inch wrought-iron pipe railing is built along the entire length of the lake wall, and eleven stairways are provided to reach the beach.

The completion of this improvement marks, locally, the end of the first stage of the rehabilitation of the water-front portion of this industrial city. It should also serve as a splendid example to other communities situated on the international boundary of the Great Lakes. If Dunkirks's example is generally followed, boundary water pollution will be largely, if not entirely, eliminated.

A Novel Alignment for Regional Planning

FOR the first time in the history of planning in this country two regional plans have pooled their issues, discussed and approved common projects, and worked out an inter-regional program. The regions affected by this hook-up are the Philadelphia Tri-State District and the Berks-Reading Metropolitan District, 60 miles north of Philadelphia.

The latter regional plan involves 182 square miles, and includes the city of Reading, 9 townships, and 26 boroughs and adjacent communities. It is a comprehensive plan, with emphasis laid upon highways, parks and parkways, to open up the Berks-Reading region still farther to the seaboard.

The conference which determined the hook-up between these two regional plans was held in Philadelphia April 10. The Philadelphia plan was represented by Director William H. Connell and Planning Engineer Joseph T. Woodruff, the Berks-Reading plan by City Engineer E. Clinton Weber, Planning Engineer Albert W. Gotch and Borough Engineer Fred H. Dechant. Highway connections, parkway tie-ins, and the development of a mountain area adjacent to the Schuylkill Valley in southern Berks County and the northern portion of Chester County was approved at this occasion.

The park projects approved and agreed upon at the conference embrace what is said to be the largest mountain park area in this country outside of state and national reservations. The development of the area is being promoted by the South Eastern Pennsylvania Parks Association, of which Ernest J. Poole, Chairman of the Community Council of Berks County, is President.

The Berks-Reading regional plan is now being promoted by the Planning Foundation of America under the direction of Nathaniel S. Olds. A fund of $85,000 is being raised, a considerable amount of which, even in this period of depression, has been pledged. The city government of Reading has voted an appropriation of $10,000, and it is expected that the county authorities will vote $15,000 and the School Board $5,000. The remainder of the fund is being subscribed to by the borough governments and private citizens. The plan is sponsored by the Community Council of Berks County, and is being made by John Nolen and Associates. It was begun in 1930, and is scheduled to be completed in 1932.

165,000,000 Days' Work in Billion-Dollar Construction Program

ASSUMING 300 days' work in a year, at about $4.85 per day, Commissioner Ethelbert Stewart of the Bureau of Labor Statistics, U. S. Department of Labor, has estimated that $1,000,000,000 in construction projects would give about 550,000 men jobs for a year.

Mr. Stewart pointed out (in the *United States Daily* for April 1, 1931) that of the 550,000 men put to work, a tenth, or 55,000, would be employed directly on the construction, and the remainder would be given work indirectly. These figures are based on the assumption that about 80 per cent of the $1,000,000,000 would go directly or indirectly to labor.

The ratio of 1 to 10 for workers employed directly and indirectly through construction programs is a fairly conservative one, in the opinion of Mr. Stewart, inasmuch as building projects indirectly provide labor in iron mines and rock quarries, in steel plants, on railways transporting the materials, and in various other lines.

The employment of 550,000 men for 300 days each would result, of course, in 165,000,000 days' work for these men—and in a tremendous stimulus to business generally.

A Program for Police Improvement in Chicago

A Notable Police Study, of Widespread Interest

No police department has been subject to more discussion and criticism in the last few years from the press and the public generally than that of Chicago. There is now available an expert and impartial study of it, by Bruce Smith, widely experienced police specialist of the National Institute of Public Administration, New York, with a staff of assistants, under the auspices of an eminent Citizens' Police Committee and in cooperation with Police Commissioner William F. Russell while he was in office. "Chicago Police Problems"* is a comprehensive, compact report of the exhaustive survey that was made. In its treatment of different phases of police work a number of constructive suggestions are made as to the work of the patrol force, the detective division, control of traffic, crime prevention, and other highly varied police activities. The final chapter, presented herewith, briefly sets forth a recommended program of future changes and developments, which are of general as well as local interest.

* See review in department of Municipal and Civic Publications in this issue.

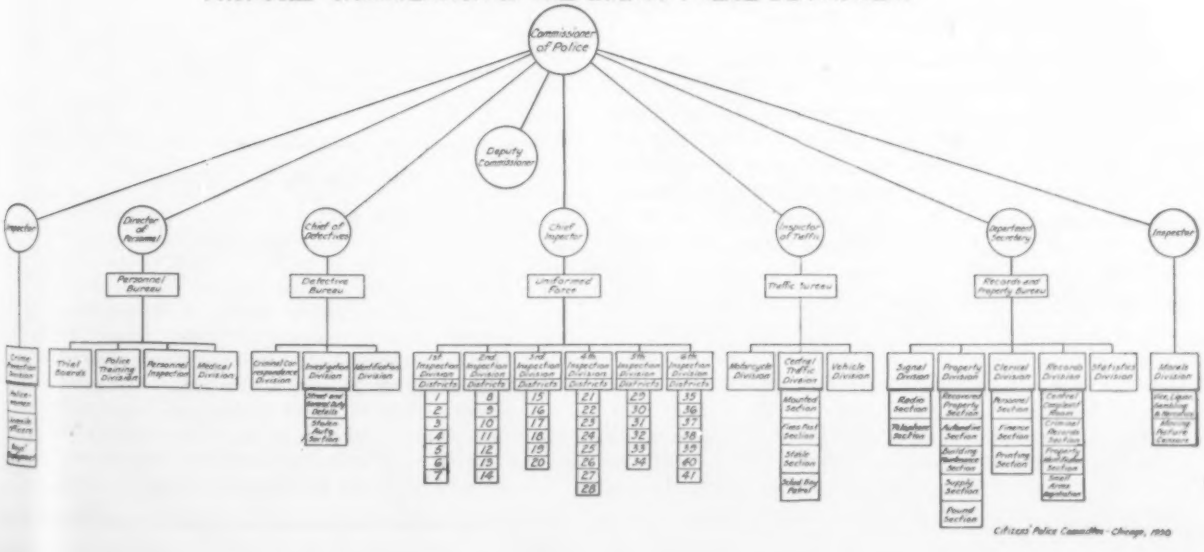
NOT all of the recommendations here contained are of equal significance. Some of them go to the very root of police administration, while others involve mere refinements in practice and procedure. Although all alike are but parts of a single analysis, it is natural that some of these proposals should take precedence over others. The process of subordination which must result leads to the formulation of a definite administrative program.

A Break with Tradition

Such a program, to be successful, will require a distinct break with the old police tradition. It will require reversal of many ancient procedures, a new concept of police service, and leadership of the highest quality. This will involve at the very outset certain major changes. Continuity of service for the police commissioner will prove to be essential if large and lasting results are to be secured. The commissioner's control over the rank and file, in the matter of selection, promotion, and discipline, must be greatly extended. The influence of the Civil Service Commission, dominated as it has been in the past by political influences, must be confined to narrow limits or destroyed altogether. That these several steps will be taken under a strictly partisan régime is only remotely possible. The fact must be squarely faced that it is difficult to raise police administration above the general level of municipal services when there is a continuing tendency for it to sink below that level. In other words, the future of police service in Chicago is closely allied to that of the city government as a whole, and cannot permanently be separated from it.

If police leadership of unusual quality is secured, and the office of commissioner is endowed with powers commensurate with its responsibilities, certain major problems will immediately demand attention. Constant rather than sporadic recruiting should be undertaken throughout an area of sufficient size to guarantee an uninterrupted supply of human raw material possessing the necessary qualifications. Recruits who have not yet acquired binding family ties may be provided with free quarters in the

PROPOSED ORGANIZATION OF THE CHICAGO POLICE DEPARTMENT



ample space available for that purpose in district stations. In this way their first contact with Chicago will be of a professional police nature, uncomplicated by associations with local poolrooms, "speakeasies," and similar resorts. For much of the time that they are off duty they will be readily available as an emergency reserve and will thus constitute a form of security against the riot hazard which hangs like a threatening cloud over Chicago's present and future.

Several police districts may well be designated for experimental purposes. In such units the sector-patrol plan developed in Hertfordshire, England, the decentralized patrol system of Newcastle-upon-Tyne, and the extensive use of "straightaway" beats as practiced in New York City may be given a practical local application. These and similar expedients are barred under existing conditions, because recruits are scattered far and wide among the numerous police units and quickly receive the impress of the old tradition.

The Uniformed Force

From the outset, also, the plan of structural reorganization will merit attention, and the administrative conflicts and lost motion which now characterize the police organism must be rigorously eliminated. The uniformed force should be returned to the primary duty of protective patrol, and all but especially difficult cases turned over to it for investigation. Daily inspections by divisional commanders should be employed as the commissioner's chief means of maintaining contact with the far-flung system of police districts. Civil employees should be substituted for police in all grades and positions requiring clerical, technical or trade skill.

The traffic bureau will need to be expanded by the addition of outlying traffic zones which supplement the central zone already in operation. Extension of the police department's sphere to include the areas now protected by the independent park police forces will also prove highly desirable.

Finally, the administrator should devote a part of his attention toward progressive improvement in the technique of crime and prevention, in order that the police force may contribute its full share toward the ultimate solution of this baffling problem.

The Weeding-out Process

The foregoing program involves practically every unit in the Department, and its realization will be the work of years. For the most part it will be of a distinctly constructive nature. However, it will almost certainly fail of success unless the elimination of unfit personnel is constantly pursued. By retirement and by administrative trial those members of the force who will oppose all efforts directed toward a new order of things must be relentlessly weeded out. So long as they possess police powers of any description, the Police Department will continue to deserve the description applied to it by a Cook County grand jury—"rotten to the core." Clearly, the rehabilitation of the police force is not going to be a simple matter.

When all is said and done, the force will rise or fall according to the administrative capacity which it is able to attract. As noted in an earlier chapter, such leadership will not be secured, or if secured will not prove effective, so long as the familiar relationships between politics, the police, and the criminal element continue to prevail. It is not by any means certain that the citizens of Chicago are even yet prepared to commit themselves to the great task of civic reconstruction. It may be that long years will elapse before any advance is effected along the entire front. In that event the extensive program here offered will be tossed for a time into the discard. Even so, there will perhaps be a certain degree of improvement, because this study has been conducted largely from the police standpoint and therefore will commend itself to many police officers. Numerous recommendations which do not strike at the root of the police problem may be adopted from time to time. In fact, some of them have already been accepted and placed in operation. As to these special aspects of police service, some improvement will follow.

Yet it is quite obvious that the Chicago police problem cannot be solved by any such casual method. It will be necessary to cut deeply before the cause of present inefficiency and corruption can be removed. Minor expedients which would yield favorable results in cities with a less aggravated condition will surely fail of significant effect when applied to Chicago.

The city has gloried in its frontier character. Coming into existence after the true frontier had already moved farther west, Chicago throughout its history has nevertheless been a continuing symbol of the frontier spirit. In vigorous and sometimes boisterous fashion it has pushed on to one achievement after another, with little or no care for government and the things which government can contribute.

A New Ambition

Within recent years there has come a change. Chicago is no longer content to measure its achievement solely in terms of industrial production. It still points to these, as it should, but it also strives for recognition as a world-center of culture. It now emphasizes not only the number of hogs and cattle received, packed, and shipped, but also its literature and art, its civic opera, its universities, and its great architectural monuments to commerce and industry, as indices of civic aspiration. This change of front may prove to be significant. If it truly indicates a new course directed toward building a well-rounded community in which the peaceful arts will flourish, where life and property will be secure, and where the "wide-open town" will be succeeded by a high degree of public order, then without doubt these ends will be realized.

—Copyright, 1931, by Leonard D. White (Chairman of Citizens' Police Committee).

Aids for Police Officials

In the newly published 1931 MUNICIPAL INDEX features of interest to police departments, prosecutors, etc., include an article entitled "Cooperation Among Law Enforcement Officials," by J. Edgar Hoover, Director of the Bureau of Investigation, United States Department of Justice (pages 712-715), and "Methods for Studying Traffic Control Problems," by Dwight McCracken, Erskine Research Fellow, Harvard University (pages 320-337). Another portion of the volume, Section 17, contains a list of police chiefs and their salaries in cities of 10,000 population and over.

Low-Cost Bituminous Treatment on Roads in the Western States—II

Reported by J. T. Pauls,
Senior Highway Engineer,
U. S. Bureau of Public Roads,
Washington, D. C.

Slow Drying Emulsions Show Promise

The problem of developing an emulsion that would have a sufficiently retarded breaking point to permit mixing has not as yet been completely solved. Although material of this type is being made with a relatively slow break, experience shows that fine aggregate and dust accelerate the breaking of the emulsion. It has also been observed that the emulsion has a tendency to combine with the fines and leave the larger particles uncovered. This condition necessitates considerable rolling to incorporate these coarser particles and obtain a bonded mass.

Mixing and application of oil or water with the aggregate delays the breaking of the emulsion and makes it possible to obtain a better coating of the stone. Keeping the amount of fines in the aggregate to a minimum also reduces this difficulty. Although these recent changes in methods of construction and materials have in general improved the results obtained with this type of emulsion, further work along this line may well be done, as its use in the mixed-in-place type of treatment has not yet proved entirely satisfactory.

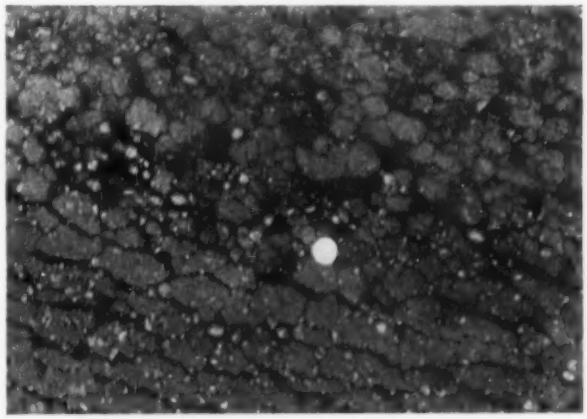
The Use of Cut-Back Asphalt

Another material which has recently been tried out in mixed-in-place construction is cut-back asphalt. Both the 94 per cent grade of road oil and the 100 to 120 penetration asphalt material cut back with kerosene have been used. These materials seem to be entirely suitable for mixed-in-place construction. On the work so far completed, the ease of construction and the excellent early appearance of the surface indicate that favorable results may be expected for this type of material. While its cost may be slightly higher than that of materials now in general use, it is believed that considerably better results may be obtained by using a heavier type of bitumen, as it offers greater resistance to raveling, particularly in freezing weather, and will withstand failure from moisture.

Wet-Weather Conditions Require Heavier Road Oils

Experience has shown that oil-mixed surfaces in which the more fluid grades of road oil have been used fail rapidly under conditions of moist subgrade and wet weather. These road oils are not easily volatile under atmospheric conditions, and stay in a fairly fluid condition in the surface mix. The fluidity and lack of great adhesiveness permit the water, moving up from the subgrade into the mix, to dislodge the oil surrounding the mineral aggregate in the lower strata, carrying the oil to the surface, where it gives the impression of bleeding or of an excessively rich mix. The waterlogged surface loses its stability and begins to shove and rut, since the action of traffic under these conditions tends to destroy the bond of the mix. This effect is due, no doubt, to the scrubbing and kneading action of traffic, which causes dislodgment of the oil from the surfaces of the stone particles.

Laboratory tests in conjunction with field observations



TYPICAL FAILURE OF A LIGHT-OIL-MIXED SURFACE DURING DRY WEATHER FOLLOWING THE ACTION OF MOISTURE

indicate that road oils of high viscosity and high specific gravity resist the action of moisture better than the lighter materials, and also that a rich mix is more resistant to the action of moisture than a lean one. Although methods of construction or modifications of the materials may be devised for their more successful use, light oils are not at present proving satisfactory for the mixed-in-place treatment under wet or freezing conditions. Consequently, there has arisen a great deal of interest in the use of heavier bituminous materials such as cut-back and emulsions of this type of construction.

The Relatively High Stability of Cut-Back Asphalt

While there have been no recognized tests for determining the relative efficiency or binding powers of the various oils that have been used in the oil processing, recent tests have been made in the laboratory of the U. S. Bureau of Public Roads, using the Hubbard-Field stability test as a criterion. These tests indicate that there is a wide difference in the stability and the rate of hardening of these various road oils in fine graded mixtures. The comparatively high stability obtained with the two cut-backs indicates that this type of material should prove more resistant to the destructive action of water, surface raveling and displacement than the oils now in common use.

The two cut-backs tested represent a type of bituminous material which has only recently been used in the West, but which has been extensively used in the East for both surface treatment and cold mixing. In the eastern states gasoline and similar distillates have generally been used as

fluxing media. It was thought that the use of gasoline in cut-backs for mixed-in-place work would result in a too-rapid stiffening of the road mix, thus preventing thorough covering of the stone and rendering the compaction of the finished surface more difficult. Therefore, after experimental work in the laboratory, two grades of cut-back using a less volatile solvent, such as kerosene, were suggested and are being tried out in the West. The evaporation of the kerosene is not too rapid to interfere with the covering of the stone and subsequent compression, and the finished pavement develops a stability which could not be obtained with the usual light oils used in this type of construction.

case, good judgment and considerable experience are necessary to determine the proper amount of oil to be used.

The tendency now is to use more oil than formerly, and considerably better results are being obtained. On the early work in many of the states, the amount of oil used was determined by the stain test and the formulas were developed primarily on the basis of experience in southern California. It has since been found that considerably more oil is required in areas with colder climates. In some of the states and with certain types of mixtures, it is frequently found necessary to use as much as 50 per cent more oil than is called for by the stain test or by any formula.

CONSTRUCTING A MIXED-IN-PLACE SURFACING—APPLYING BITUMINOUS MATERIAL, DISKING AND MIXING

The Proper Amount of Oil an Important Consideration

The amount of oil necessary for a particular job depends largely on the grading and character of the aggregate. The more fine material present, particularly of the size passing the 200-mesh sieve, the more oil is required. In all cases, sufficient oil should be used to coat all the particles and partially fill the voids. The use of less than this amount results in an early raveling and failure of the surface. Allowance must also be made if the aggregate is of a character that absorbs oil. This is particularly true when the aggregate contains an appreciable amount of soft limestone.

Several methods are in general use to determine the amount of oil required. The most common of these are the stain-test, formulas, and the "cut and try" method. The latter involves the determination of the requisite amount of oil on a short portion of the road as a guide in conjunction with the grading of the aggregate determined periodically for the remainder of the project. Some engineers depend on the cut-and-try method, using the stain and formula or both, as guides during the work. In any

Another method which should be considered in determing the amount of oil to be used is the moisture in the aggregate. If the moisture present, which is generally appreciable, is not taken into account, extraction and stain tests may indicate high oil content when in reality the mix is lean. An error in judgment may occur if the appearance of the mix is used as a guide in determining the amount of oil to be used, as a small amount of moisture will invariably give the appearance of more oil than is actually present.

Thickness of Section for Mixed-in-Place Surfaces

The thickness of oil-mixed surfaces has been found to range from 1½ to 3 inches, but in the majority of cases examined it was 2 inches. Washington seems to be the only state using the 1½-inch section, and this may be explained by the fact that this type of construction is regarded in Washington as a temporary improvement, later to be strengthened by surface treatment or to be replaced by some higher type of construction. Washington also primes the base before construction of the mixed mat. This procedure no doubt improves the base condition and also

serves to strengthen the wearing surface. With the exception of Washington, however, there appears to be a growing tendency to regard 3-inch compacted as the minimum thickness for a satisfactory mat.

Methods of Maintaining Oil-mixed Surfaces

Maintenance methods used on oil-mixed surfaces depend not only on the condition of the road, but also on the policy of the engineers in charge. The general practice is to use one or more of the following methods:

a. Repairing holes and breaks as they develop by using premixed materials.

b. Enriching the surface periodically by surface applications with road oil.

c. Scarifying and remixing with additional oil.

d. Applying the surface treatment, consisting of hot applications of material or emulsions and covering with crushed stone or gravel.

The practice of surface treating the oil-mixed surface in order to provide greater wear resistance and to reduce the maintenance cost seems to be gaining in favor. This treatment provides an inexpensive method for improving oil-mixed roads to meet more adequately the needs of increased traffic.

The application of additional light oil to enrich the mix is used quite extensively in southern California, but does not seem to be much in favor elsewhere. The main objection to this treatment is the raveling and peeling which occurs under traffic during the period of drying. This method of maintenance seems to be of doubtful value except where traffic can be detoured for a time while the surface is hardening.

LIGHT-OIL-MIXED SURFACE RAPIDLY FAILING ON ACCOUNT OF INSUFFICIENT OIL
Note coarse aggregate thrown to edges

Light-Oil-mixed Surfaces in Moist Climates

Northern California, Oregon and Washington favor surface treatment rather than the light-oil-mixed type, particularly in sections where wet subgrades or moist and freezing weather conditions prevail. It has been the experience of these states that light-oil-mixed surfaces do not prove satisfactory under these conditions. Water from the subgrade seems to rise freely to the surface, carrying with it the oil from the mix below. The early behavior of the mix when acted on by moisture gives the appearance of richness, that is, it bleeds and tends to shove and become wavy and then breaks. The oil-mixed type of surface is far from being waterproof. The amount of oil used is generally sufficient only to coat the mineral aggregate without an excess to decrease the voids materially. Furthermore, the compaction is not sufficiently thorough. Those two conditions render the pavement porous with a tendency to become waterlogged.

Cost Data

Such data as are available indicate that the cost of the oil-mixed treatment, exclusive of the cost of the aggregate, ranges from $1,000 to $2,000 per mile for an 18-foot width of 2 to 3 inches compacted depth. This figure does not include the cost of the base stone, which varies considerably, depending chiefly on the cost of the aggregate in place. For a large amount of this work under a range of conditions, the cost for a 5- to 6-inch compacted crushed gravel or stone course ranges from $3,500 to $4,500 per mile.

Although definite figures on the cost of maintenance of oil-mixed roads are very limited, such data as are avail-

100 TO 120 PENETRATION ASPHALT CUT BACK WITH KEROSENE—SMOOTHING THE MIX PRIOR TO COMPACTION

able indicate that the treatment is economical in comparison with untreated macadam.

The cost of surface treatment of 600 miles of untreated macadam in Idaho during 1928 was $285 per mile, exclusive of material replacement, while on 200 miles of the oil-treated surface it was $294 per mile. The traffic on the former was 100 to 200 vehicles per day; on the latter from 100 to 1,200.

The annual maintenance cost in Wyoming during 1928 on a considerable mileage of treated roads averaged $330 per mile.

Conclusion

The results of this survey lead to the following conclusions regarding the use of the mixed-in-place method for gravel or stone aggregate:

1. In sections where conditions are suitable, such as arid and semi-arid regions, the light-oil-mixed treatment is proving satisfactory and economical and will undoubtedly continue to be used extensively.

2. Light oil does not give a sufficiently well-bodied surface to prevent raveling under heavy traffic, particularly in cold weather, nor does it withstand the action of moisture.

3. For unfavorable conditions a heavier asphaltic oil or a soft asphalt cement, cut back with a distillate, such as kerosene, naphtha, a combination of both, or a suitable asphalt mixing emulsion, should be used. A surface treatment using a hot application material or emulsion on either the light-oil mix or on the untreated macadam may be used to obtain more satisfactory results.

4. An insufficient amount of oil has been used on much of the work up to this time, resulting in many failures and high maintenance costs. The fact that a bituminous mix has the greatest resistance to deterioration when its bitumen content is the maximum allowable as judged from the stability required, seems to have been ignored generally on bituminous work in the West. It seems indeed that the attempt has been made to use the minimum amount possible.

5. Very little shoving and corrugating occurs. When such defects are found, they are generally due not to excess oil but to moisture or subgrade conditions.

A Motor Fire-Truck Where No Roads Exist

ALONG the south shore of Long Island, N. Y., for over a hundred miles, is a magnificent stretch of beach fronting on the Atlantic Ocean. For the greater portion of the distance it lies on a series of long, narrow, sandy islands and peninsulas separated by lagoons or bays from the main island. The longest unbroken portion of this outlying beach, and one of the most secluded, is known as Fire Island Beach, a narrow tongue of land occupying the middle 35 miles or so of the entire stretch. Except at the eastern end, where it joins Long Island proper, and at one midway point where a bridge has lately been built, the only access is by boat, and as there are no roads, the "island" is therefore but little developed. There are several summer colonies, reached by small ferries.

THE FIRE TRUCK
and the conditions under which it must serve the community

Because of the scarcity of bridges and the absence of highways, or even passable streets, there is naturally little chance for automobiles. At Ocean Beach, one of the resorts, there has been a system of cement sidewalks for some time, sufficiently complete to enable a few light motor trucks to get around, and there is a fire department with Ford trucks that navigate with the aid of the walks, without which they would be well-nigh helpless.

Recently the proprietors of Point o' Woods, another of the settlements, decided that a fire-engine was urgently needed. There had been several fires, with which the resident volunteer fire-fighters with their hand-drawn equipment had contended as best they could, but the loose sand everywhere was a great impediment, which not only obstructed their efforts but seemed to render the use of modern motor equipment impossible; for while there is a considerable number of cement walks, they are neither continuous nor wide, the community is quite spread out, and it seemed undesirable to be so restricted, even if it were practicable for trucks to use the walks. The problem was solved, however, by the use of a fire-truck employing a tractor type of tread extending around two rear wheels on each side, which gives traction even on the shifting sand, and permits a speed of 15 to 20 miles per hour. The same principle was used for a general-purpose delivery truck, which functioned throughout the past summer. Each truck consists of a Chevrolet chassis with a Trucktor attachment at the rear. The fire-truck mounts a U-34 Barton centrifugal fire pump at the front. It has a special hose body, and fire-fighting accessories.

A system of fire-hydrants has been installed, and with the new and efficient protection provided by the Point o' Woods Association, which can be brought into action anywhere in the community within five minutes, the residents are relieved of their fears that their homes might be swept by a conflagration against which they have hitherto had no adequate defense and which, under seashore conditions, might have assumed devastating proportions.

Water Rates and Regulations

Part I

Water-Meter Rates

Hydrant Rentals and Sprinkler Charges

Regulations Covering Taps and the Installation of Services

SO numerous are the requests received by THE AMERICAN CITY for information on the details of water rates charged by various cities and on hydrant rentals and sprinkler charges and the regulations for the making of taps and installation of services, that we have gathered reports from a large number of representative cities. Beginning with this issue, these will be published serially.

An examination of the various types of rates, the minimum rates, service charges, modified service charges and the jump and modified jump scales for meter rates, as well as the sliding scale, will be very helpful to water works in making adjustments in existing local rate schedules.

Selma, Ala.—18,012

WATER RATES

Gallons per Day	Per 1,000 Gallons
2,000 or less	45c
2,000 to 3,000	35c
3,000 to 5,000	30c
5,000 to 10,000	25c
10,000 to 20,000	20c
Over 20,000	15c

Minimum charge, $1.50 per month.

PRIVATE FIRE HYDRANTS

Size of Hydrants	Per Year, Each
2½" two-way	$ 67.50
1¼" to 1½", one-way	15.00
3-way steamer	101.25
3 or more 2½", two-way	50.00
3 or more three-way steamer	76.00

For automatic sprinkler service, the minimum charge made by the Selma Water Works Commission is $40 per year, sprinkler heads being charged at 7½ cents each per year. A discount of 33⅓ per cent is allowed on all bills paid by the 10th of the month following service.

Mesa, Ariz.—3,711

The minimum monthly charge for water by the municipally owned water department of Mesa, Ariz., is $2.25, which entitles the customer to 10,000 gallons of water. All water in excess of 10,000 gallons per month is charged at 5 cents per 1,000 gallons.

Hydrant rentals are charged on the books at $50 each per year, but, as the city owns the water plant, no actual transfer of money is made except from one fund to another.

No schedule is maintained for private fire service nor for sprinkler systems.

The customer pays for all taps and the laying of all service connections, but the city furnishes and maintains all meters within the city limits except sizes larger than 1-inch. Larger sizes are paid for by the customer. The city maintains the water service to meter or property lines.

Yuma, Ariz.—4,892

WATER-METER RATES

Gallons per Month		
First 6,500 or less	$2.00 minimum	
	Per 1,000 Gallons	
Next 3,500	30c	
Over 10,000	17c	

A charge of $5 per month is made for each hydrant. The amount for sprinkler charges is billed under the water-meter rate.

Before making a new service contract, the prospective consumer must first sign a contract for one year's service with the Arizona Edison Co. This contract is to be signed by a real estate owner, or, in lieu of contract, a deposit of $15 may be made as guaranty of faith. The deposit is refunded by applying it to the payment of monthly bills until the total amount deposited has been paid.

Blytheville, Ark.—10,095

In Blytheville, Ark., a deposit of $3 or more is required by Associated Utilities, Inc., a private company, for service for all customers. Customers must repair all leaks in the service line from the water main to the meter and must keep meter boxes accessible for reading at all times.

WATER-METER RATES

Gallons per Month		
First 2,500 or less	$1.50 minimum	
	Per 1,000 Gallons	
Next 2,500	30c	
" 5,000	20c	
Over 10,000	15c	

Special rates are made to industries and users of large quantities. Bills are due on the first of each month and become delinquent after the 10th. Service will be discontinued after the 15th and a service charge of $1 made to reinstate the service.

Fire hydrants are rented to the city and to private industries at $40 per hydrant per year. For 6-inch sprinkler service, a charge of $4 per month is made.

The company does not make service taps, this work being done by plumbers under the inspection of the City Engineering Department. All services are required to be of lead, copper or cast iron and all services must be approved by the company before water is turned into the service.

Jonesboro, Ark.—10,326

The City Water and Light Plant of Jonesboro, Ark., makes the following charges for metered water:

Gallons per Month		
First 3,000	90c	minimum
	Per 1,000 Gallons	
Next 10,000	27c	
" 40,000	22.5c	
" 50,000	18c	
" 100,000	13.5c	
" 100,000	9c	
Over 303,000	8c	

Sprinkler heads are charged for at $75 per year for 1,000 or less, and 7½ cents per head for each additional.

A charge of $6 is made for a ¾-inch service laid to the curb, all larger services being charged at cost less $6.

Burbank, Calif.—16,662

The Public Service Department of the city of Burbank, Calif., charges the following rates for metered water:

Cubic Feet per Month	Per 100 Cubic Feet
First 10,000	13c
Next 40,000	11c
" 50,000	9c
" 100,000	7c
Over 200,000	6c

MINIMUM RATES

Size of Meter	Per Month
¾"	$1.00
1"	1.25
1½"	1.50
2"	2.00
3"	3.00
4"	4.00
6"	6.00
8"	8.00

Water for industrial plants, for industrial purposes only, serviced through a 1-inch or larger meter, is charged for at the rate of 13 cents per 100 cubic feet for the first 1,000 cubic feet, and 9 cents per 100 cubic feet for all additional. The minimum monthly charge for this class of service is $5 per meter per month.

Water for agricultural purposes only, served through a 1-inch or larger meter, upon districts or parcels of land planted to trees and crops grown for commercial purposes only, is charged for at a rate of 6½ cents per 100 cubic feet. The minimum monthly charge for this class of service is also $5 per meter per month.

The following charges apply to inde-

pendent private fire lines where water is to be used exclusively for fire protection, whether they be connected with automatic sprinkling systems or to hose attachments:

Size of Service	Per Month
2"	$1.00
3"	1.50
4"	2.00
6"	4.00
8"	6.00

The Department requires that charges for service connections be paid before the connections are made. The following rates apply:

Size of Meter	Charge
¾"	$18.00
1"	26.00
1½"	57.00
2"	79.00

For each service connection larger than a 2-inch meter, the actual cost of labor and material and the proper proportion of the overhead and administration costs of the Department are charged, plus 10 per cent.

Oakland, Calif.

On and after July 1, 1931, the East Bay Municipal Utility District, which comprises the cities of Oakland, Berkeley, Alameda, Richmond, Piedmont, Albany, San Leandro, Emeryville and El Cerrito, Calif., will charge the following rates for metered water:

Cubic Feet per Month	Per 100 Cubic Feet
First 3,300	25.3c
Next 30,000	24c
" 300,000	19c
Over 333,300	16c

Service Charges

Size of Meter	Per Month
⅝"	$0.55
¾"	1.10
1"	1.65
1½"	2.75
2"	4.95
3"	8.80
4"	13.75
6"	27.50
8"	44.00
10"	62.70
12"	84.70

Metered Fire Service

Size of Meter	Per Month
4"	$9.00
6"	15.00
8"	24.00
10"	34.00
12"	46.00

Public Use Charge for Pipe Line

Size	Per Year
12"	$55.00
6" to 12"	33.00
4" to 6"	11.00

Public Use Service Charge for Hydrants

Size of Hydrant	In All Cities Except Oakland Per Year	In Oakland Per Year
4"	$8.80	$3.30
6"	11.00	5.50

Where an extension of a distribution main within a developed section of the District is necessary in order to install one or more domestic services, the District will extend the main at its expense a distance of 150 feet for each service, provided that the services are put to immediate and permanent use. Prior to the installation, the applicant must deposit with the District the estimated cost of any additional extension required. This deposit will be refunded at the rate of $75 for each additional bona fide service connected to the extension until the entire amount of the deposit has been refunded. No refunds will be made, however, after ten years from the date of the installation contract.

Where a distribution main extension is desired within a new tract, the applicant is required to deposit the estimated cost of the installation over and above an allowance of $75 for each service applied for. This will be refunded in the same manner as above.

Where an extension for industrial consumers is in excess of 150 feet for each service, the applicant must deposit with the District the estimated cost of the excess extension made by the District, which will be refunded to the applicant over a period of not exceeding ten years as follows:

At the close of the first year four times the revenue received from services connected directly to the said extension for that year; and at the close of each succeeding year four times such revenue for such year in excess only of the maximum annual revenue received during any preceding year; provided that the entire refund shall not exceed the entire amount deposited and that no refund shall be made after ten years from the date of installation of the extension. In computing said refund no credit will be allowed for revenue from services that were installed prior to the installation of the said extension.

Pomona, Calif.—20,804

The following minimum meter rates are charged on all domestic industrial and commercial services by the municipal Water Department of Pomona:

Size of Meter	Allowance Cubic Feet	Per Month
⅝"	700	$1.25
¾"	700	1.50
¾"	900	1.55
1"	1,200	2.00
1½"	1,600	2.60
2"	1,900	3.05

Water Rates

Cubic Feet per Month	Per 100 Cubic Feet
700 to 5,000	15c
Over 5,000	8c

A penalty of 25 cents is added to the bill if not paid within 30 days from date rendered.

A total of $325 per month is charged against the city for all hydrants.

Where pipes are furnished for private fire protection, a charge is made for time and material plus 10 per cent for overhead, and includes, wherever it is deemed necessary to install a proportional meter, the cost of the meter. Such services are to be used only in case of fire.

The following charges are made for installing services and meters:

Size of Service	On Unpaved Streets	On Paved Streets
¾"	$20.00	$30.00
1"	35.00	45.00
1½"	60.00	70.00
2"	90.00	100.00

Services larger than 2 inches and all services outside the incorporated limits of the city are charged for at the cost of material and labor used, which must be deposited in advance with the Water Department.

All rates are due and payable when the bill is rendered, and become delinquent after 30 days. If delinquent bills are not paid upon presentation, the water may be shut off and a charge of $1 made for again turning it on.

All services and water meters installed by the Department are the property of the city and are maintained, repaired and renewed by the city when rendered unserviceable by normal wear and tear. All shut-off valves are installed by the Department for the sole use of the Department, except in case of emergency. For ordinary usage, consumers must provide their own valves.

Alamosa, Colo.—5,107

The Alamosa water works, a municipal plant, makes the following meter rate charges:

Gallons per Month	Per 1,000 Gallons
2,000 to 5,000	27c
2,000 to 10,000	25c
2,000 to 20,000	18c
2,000 to 60,000	15c
Over 60,000	12c

The minimum charge for water is $1.25 per month. All bills are due on the first of the month, and if not paid on or before the 15th, the water may be shut off until all rents are fully paid, together with a fee of $1 for turning on the water.

Groton, Conn.—4,122

The Board of Water Commissioners of Groton has adopted the following schedule of meter rates for the use of water:

Gallons per Six Months	Per 1,000 Gallons
First 200,000	25c
Next 800,000	20c
" 1,000,000	16c
" 8,000,000	13c
" 10,000,000	11c
" 10,000,000	9c
Excess	8c

Minimum charge $5 per year.

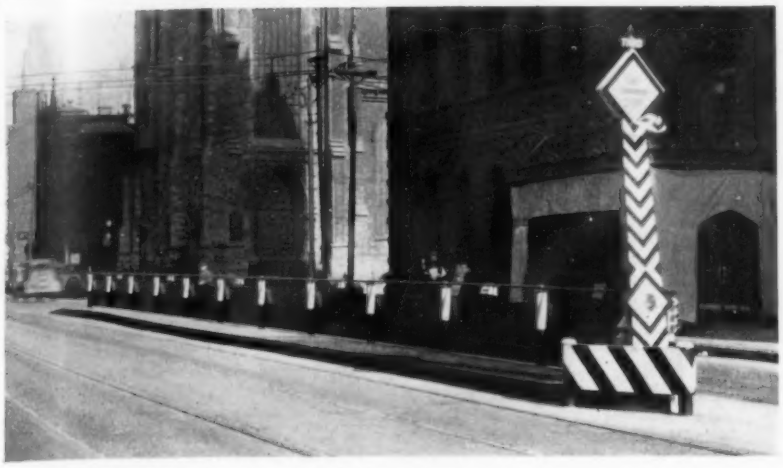
There is no charge for hydrants and the charges for private fire service, including the sprinkler charges, are being revised.

The city will lay the service pipe to the curb line, and the owner of the premises must pay for all pipe and fittings beyond, as well as the cost of laying. No service pipe will be laid where the annual water rental will be less than $6. Meters set and furnished by the Department will be charged for at an annual rental of 10 per cent of the cost of the meter, or meters will be sold to consumers at cost.

(To be continued in the June issue)

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others



A NEW SAFETY ZONE
at Woodward and Witherell Avenues, Detroit

Evolution of Street-Car Safety Zones in Detroit

DETROIT, MICH. — The accompanying photographs of a safety zone installed a few weeks ago at Fort and Third Streets show the latest development in a ten-year evolution of platforms for the protection of street-car passengers in the streets of Detroit.

Early in 1921 numerous accidents and fatalities to persons waiting for street cars made some sort of protection essential. Accordingly, the Department of Public Works constructed a wooden platform on the east side of Woodward Avenue running south from Gratiot Avenue to the Opera House crossing. While this met with favor, there were many undesirable features. The red lanterns on the end against traffic were dim. Wheels from passing vehicles split pieces off along the edges and left a rough, uneven surface. Wet weather made the platform slippery, and constant maintenance was required.

Profiting by the experience gained with the wooden platform, many new features were incorporated in the building of a concrete platform. It was built 8 inches high at the street side, with electric bull's-eyes sunken in to indicate a step. On the end against traffic was installed a light with a red globe to warn oncoming traffic. All this worked fairly well, but many changes and improvements have been made since the installation owing to the changing traffic demands and street-car regulations. The use of the bull's-eyes has been discontinued. These were spattered with mud after every rain or flushing of the street and were always more or less non-discernable. In 1927, the Department of Street Railways covered the platform with an elaborate and ornamental covering. The upper part of this was removed in 1929, leaving a section hand-rail height with three entrances from the street side.

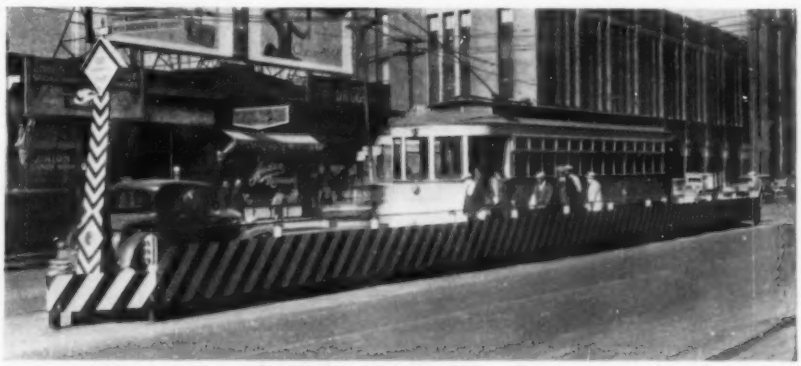
After some other experimentation a post and chain type zone was installed at Woodward Avenue and Witherell Street in April, 1923. Subsequently the street side was chained off between the posts for the entire length of the zone. Entrance and exit was from the crosswalk.

The Police Department received many complaints regarding the inconvenience of entering and leaving from one point. As a result, the chain was removed from the center of the zone and at the light, affording three entrances and exits. Some time later an order was received to remove the chains entirely, as a dangerous practice of sitting and swinging on this protection had arisen.

As the skip stop and three-car trains were under consideration, the zones were built with portability in mind. The early design, therefore, was a post inserted in a sleeve, the post being easily removable in case of accident. Since, however, we found that only the posts at the end against traffic were apt to be damaged, these two posts are still in sleeves, while the rest are embedded in concrete.

There are in operation at the present time 338 zones of the post type. The average cost per zone, including labor, material and light, is $415. Since 1923 there have been 1,584 replacements due to accidents.

The safety zone has demonstrated beyond question its efficiency in preventing accidents, especially to pedestrians desirous of boarding or alighting from street cars. The tremendous increase in all kinds of vehicular traffic traversing and congesting the main thoroughfares has added ever-increasing dangers.



LOADING PLATFORM
of the new safety zone above illustrated

At the request of the Common Council, experiments are being made with a zone that not only will be portable but will meet all the requirements of the Street Railway and the Police Departments. This latest installation has a self-cleaning, non-skid platform, built of steel grating of Blaw-Knox type. With a structural steel underpinning, this grat-

SAFETY ZONE VISIBILITY
This sketch was made in the City Engineer's office, Department of Public Works, Detroit

ing lends itself readily to use as a raised platform.

Among the salient features of the improved zone, are portability (easily removed); visibility (Hoover yellow and many lights); safety and security (all steel construction, ramped end to crosswalk, splash-guard and illuminated handrail, reflector lights on either end in case service should fail); and self-cleaning (slotted grating permits rain, snow and dirt to pass through; result, no standing in mud, slush or water).

JAN SCHMEDDING,
Superintendent of Paving.

Complete Installation of New Street Signs After Years of Neglect

WOOSTER, OHIO.—Within the last two years this city has provided itself with a complete set of new street signs, at small cost. At the beginning of 1929 the streets were probably as poorly marked as in any city of similar size in the country. An old set of blue and white enameled signs, purchased at least in part by a civic organization, were in an almost unserviceable condition. Nothing had been done to maintain or extend the system. With the laying-out of new streets and the annexation of territory, there were numerous streets which had no signs at all. To an official proud of his connection with a growing, forward-looking little city, this was at times embarrassing.

With the city faced by the need of having to retire some old term bonds within the next few years, the problem was to get the streets marked neatly, efficiently and quickly at as little cost as possible. After some study and an investigation of probable costs, enough signs to mark one downtown intersection were made after the general model described herein, and an accurate record was kept of every item that entered into the cost of producing and erecting them. A little time spent by an assistant disclosed the fact that there would be required approximately 700 signs bearing 91 different street names. The writer then informed the City Council that for $600 he could install the necessary 700 signs, bearing 91 different street names, on the design of the specimen signs. The appropriation was granted in January, 1929.

From observation and the experience of others, the writer had concluded that for inexpensive yet practical and durable signs there was no material that would answer our purpose so well as wood. By selecting a good wood for out-of-door use and keeping it well painted, decay or rot is postponed a long time.

From several varieties a local lumber dealer helped select a wood that would be suitable for the purpose. The principal requirements were that it should be durable, smooth-grained, easily worked and not too easily split. For the sake of appearance it was decided to chamfer the boards ¼-inch on the face side. One-inch stuff, 5½ inches wide, with length from 10 to 33 inches as required, was finally adopted.

After experimenting with various sizes and shapes of letters, a "half block" type of letter 3½ inches high and 2 inches wide, and with ½-inch bars, was finally determined upon. This letter is large enough to be read at a distance, and not so large but that long names can be produced on a panel of reasonable length.

We decided to make the letters golden yellow on a not too glossy black background. This combination is not objectionable to the eye, and paints of these colors hold up well. Visibility is good by day, and much better than numerous other combinations by night, or by artificial light.

As the city had no first-class workshop and drying room available, the sign-painting work was given on contract to a local sign man, who claimed that he could perform it more cheaply than the Engineering Department employees. Together we worked out a silk screen stencil device for processing the letters, consisting of a table with a rectangular frame hinged to it and guide blocks to ensure that each sign would be placed in the proper position. A piece of very fine mesh silk was stretched tightly over the frame and securely fastened to it. A rubber scraper with which to spread the lettering paint completed this part of the apparatus.

The stencils themselves were made of thin brown wrapping paper. A set of master letters was first made out of heavy stencil board. The wrapping paper was cut to the size of the finished sign and tacked to a drawing board. With a T-square for a guide, the letters were reproduced by outlining with a pencil. The bars were then cut out with a sharp razor blade fitted in a handle, leaving "ties" to hold the insides of loop letters such as "O's." This stencil work proved to be a very good "odd time" job for two men of a field party employed on the construction of an intercepting sewer during that winter. The painting contract specified that our office furnish the stencils.

ONE OF THE NEW SIGNS

Even in this small reproduction the easy legibility of the lettering is apparent

Two coats of best quality black paint and one coat for the lettering were specified. The first coat of black was "wet sanded" to remove paint pimples and smooth the background. After the background was thoroughly dry, the proper stencil for a given sign was secured, the ties for the loop letters were cut out, the stencil was laid in position, and the pieces of paper forming the insides of the loops were very carefully placed. The silk screen was then swung forward so that it pressed down on the stencil, and a quantity of paste paint, very thick, was placed on the screen. One wipe across with the rubber scraper distributing the paint was usually sufficient to make the letters. The paint, of course, penetrates the silk uniformly but does not go through the paper. The result is a well-made, uniform letter with the paint so thick that it resembles embossed work. The signs were varnished after erection, the boards being wiped clean with a moist cloth a short time before the varnish was applied.

Permission was secured from the local electric and telephone companies to use their poles, where available. Lag screws with suitable washers were used to fasten the signs. Where white-way poles were available, these were used, the boards being fastened by 90° bolts of ⅜-inch road iron. Hex nut and washers were used. The taper of the pole made the curved bolt fit snugly. Screws were used to fasten the ends of the signs together. Where no poles were available, good 4 x 4's 12 feet long with the bottom 3 feet waterproofed were used. The signs on the white-way poles were 12 feet high. The others ranged from 9 to 12 feet.

A total of 763 boards were made, of which 699 were erected in 1929. The remaining 64 were kept as spares. The whole cost was $521.04. The signs actually erected cost an average of $0.717 each, divided as follows:

Lumber	$0.159
Painting (contract)	0.155
Hardware	0.042
Labor—cutting stencils, erecting and varnishing	0.325
Distributed cost of 4-inch x 4-inch posts	0.024
Miscellaneous cost of touch-up paint (after erection), varnish, etc.	0.012
Total	$0.717

Few signs have been damaged even slightly, and they are almost without exception as bright and clean as when new. Repainting, when eventually necessary, should not cost more than originally, as the stencils and apparatus were preserved. Our citizens have expressed themselves as being very well pleased with the installation.

ARTHUR H. WEDGE,
City Engineer.

An Outstanding Community Organization for Unemployment Relief

FORT WAYNE, IND.—Our community has to its credit what the Secretary of the President's Unemployment Committee has called one of the most comprehensive pieces of work reported from anywhere in the country. Following a meeting called by the Governor last November, at which each community was asked to organize as best possible to take care of its own situation, the Allen County Emergency Unemployment Committee was formed. This consisted of representatives from the city government, the county government, industries, banks, business houses, charitable organizations as represented by the Community Chest, and the Fort Wayne Chamber of Commerce.

We first made a very careful unemployment survey through the public schools and by having registration places open for two days in the fire stations and schoolhouses in this city. In order that the Committee might help first those who needed help most, registrants were classified in five major divisions. The first two classes represented unemployed heads of dependent families living in rented or mortgaged homes, and included 1,938 applicants, of whom 233 were women, and one was a child that was the sole support of aged parents. The total number of those registered was 4,469, of whom 537 were women. Classification by vocation ranged through the alphabet, from assemblers in factories to writers of fiction, and included beauty-parlor operators, butchers, chauffeurs, interior decorators, firemen, landscape designers, musicians, porters, plumbers, chicken pickers, shoemakers, and truck drivers.

We then organized a campaign in all the industries, banks, wholesale and retail establishments, and offices, and in other places in the community, asking them to take up with their employees the matters of financial assistance in this situation. Those earning $50 a month or under were not solicited. Those earning from $50 to $100 were asked for a half-day's pay a month, and those earning $100 and over were asked for a day's pay a month, all to be for a three-months period only.

Approximately $38,000 a month was subscribed. We then went to the city and other interests and asked them to create work for the unemployed and provide supervision, with the agreement that we would pay the wages. As a result, 1,829 people were put at work.

These were placed on a basis of four eight-hour days a week for one shift. We then employed an equal number of men for another period of four eight-hour days, and then back to the second, and so on. In addition to this, we reached both through the newspapers and by radio all the householders of Fort Wayne, asking them to call our unemployment agency for men to do odd-jobs about their homes; and we are placing, on an average, 20 to 25 people a day for work lasting from an hour to two or three days. This work is paid for, of course, by the householder, and the rate of pay is settled between the employer and the employed.

The eight major projects put through have been: river bank beautification under the Board of Public Works; park improvement under the Park Board; work on the Bueter Road for the Greater Fort Wayne Development Corporation; Robinson Park right-of-way, under direction of the Indiana Service Corporation; snow removal from streets and important intersections under direction of the City Street Department; services at the municipal airport; distribution of wood to destitute families; and thrift center services in collecting and distributing food and clothing. In addition, a large number of minor projects have been carried out, exclusive of large constant placement of individuals in temporary jobs.

On Park Board work, 1,380 checks were issued, totaling $16,234; on Board of Public Works projects, 1,838 checks, totaling $21,033; on the Robinson Park car line, 433 checks totaling $5,256, etc.

Contacts were made through an employment agency established in the Old Lincoln Bank Building, which was given us rent-free by the Lincoln National Bank and Trust Co., which has moved into new quarters. Here supplies of clothing, provisions, and some furniture were brought for distribution.

A complete report of the undertaking, showing all projects, types of registrations, people employed, money handled, and even all forms and blanks used, has been prepared in permanent form by E. J. Hornick, who represented the county relief organizations on our Committee, and L. R. Pease, Employment Manager.

J. B. WILES,
Manager and Industrial Commissioner, Chamber of Commerce.

Unemployment Relief

LITTLE ROCK, ARK.—The finding of 16,235 days of labor, the placing of 150 persons in permanent positions, and the improvement of city parks to an extent that otherwise might not have been done for several years, makes the efforts of Little Rock to solve its unemployment difficulties worthy of mention.

The Chamber of Commerce opened an Emergency Employment Bureau in December, hoping to bring relief to the jobless through the stimulation of public construction, through persuading householders to begin jobs of repair and improvement about their premises, and through prevailing upon mercantile and industrial employers to stagger their shifts of workers, making possible the re-employment of any laid off and preventing the discharge of others.

Cooperation by the mercantile and industrial groups resulted in stabilizing the jobs of more than 300 people who might otherwise have been dropped completely from the payrolls. Efforts of the Bureau directed through newspaper and radio publicity to householders brought an average of twenty-odd jobs per day, each averaging about one day's duration. These jobs included every conceivable type of work about private premises and business buildings.

Though negotiations were started that will result in the beginning of Little Rock's new Federal Building during the summer of 1931 instead of in 1932 as originally planned, little was achieved during the first few weeks of the Bureau's existence towards stimulating public construction jobs. Then, in early January, in response to an appeal from the Social Welfare Bureau for additional funds, the city authorities authorized the employment of "jobless" men on streets, parks, and alleys. The employment bureau, having registered the unemployed, was designated as the agency to hire the workers. Men who had applied to the Social Welfare Bureau and who presumably had no resources to fall back upon, were given first chance. The men were hired in groups, or shifts of three hundred, each shift working three days. No man was eligible for assignment on more than one shift per week, regardless of the size of his family. Pay was $1.50 per day.

Though the city had originally planned to spend approximately $10,000 on this program, it carried the work through January and well into February, paying out nearly $14,000 in wages and giving more than 8,500 days of employment, when lack of finances necessitated the discontinuance of the program. To raise funds for furthering the relief employment, there was organized a Citizens Emergency Relief Committee, which started immediately on a campaign to secure one day's pay each month for three months from employed persons whose incomes would enable them to give. Additional money was raised through benefit dances, shows, and raffles. The funds secured made possible the employment of two shifts of 150 men each per week. Until March 21, more than 5,000 days of employment on the city's parks had been brought about through the Citizens Emergency Relief Committee. It will continue its campaign throughout April and will distribute approximately 4,000 more days of labor.

A by-product of these concerted efforts to relieve unemployment is almost as important as the achieving of the original purpose; that is, the improvement of the city's parks. Though Little Rock had several hundred acres in parks, they were not developed to a point of attractiveness that engendered pride in them on the part of the citizens and they were little used previous to this year. Now, with clean grounds, beautiful picnic spots, attractive drives, and entrancing landscapes, the parks are taking their logical place in the recreational life of Little Rock.

When the Chamber of Commerce launched the movement in December to relieve unemployment, it did not expect to place every jobless person in a permanent position. It hoped to bring some relief to the neediest. With the cooperation that its movement has received from the city and other agencies, it is highly pleased with the results.

D. HODSON LEWIS,
Manager, Chamber of Commerce.

Elevation Aids the Grass Plots

SAVANNAH, GA.—When the landscaped section down the middle of Savannah's boulevards was bounded by ordinary curbing of the standard height, it was all too easy for pedestrians seeking short cuts to walk across the grass, and even through the flower-beds, leaving unsightly paths at all angles.

The low curbing was also an invitation for motorists to go the pedestrian one better and park their cars down the central strip, especially in the neighborhood of hotels and amusement centers.

Through the Park and Tree Commission's simple expedient of doubling the height of the boundary wall, these landscaped plats were elevated above the street level to such an extent that it is a careless motorist indeed who will drive over the rough rubble wall; while the combination of uneven top and high step is ample to remind even the most heedless jay-walker that he is not confronted by a part of the city's sidewalk and pavement systems. Since raising the level there has been practically no trouble with either type of unwelcome trespasser, and the appearance of the ornamental landscaped plats is improved one hundred per cent.

ELTON STERRETT.

SAVANNAH'S CURBED GRASS PLOTS

City Planning Principles Win Remarkable Victory

ST. PAUL, MINN.—The long-drawn-out controversy over the location of a $1,500,000 state office building in St. Paul, the capital of Minnesota, has been settled by a unanimous vote in the Senate and a vote of 109 to 6 in the House on a bill which would place the building in accordance with the City Plan.

In 1929 the Legislature appropriated $1,500,000 for this building and created a commission to construct the building forthwith. The Building Commission, shortly after its appointment, by a vote of 5 to 2, decided to place the office building in the rear of the Capitol and face it with brick, making it a purely utilitarian building. It was to be placed on land already owned by the state, which had been purchased for the purpose of preventing the construction of an apartment building so close to the State Capitol.

The City Planning Board of St. Paul immediately took a stand on the matter, aroused the interest of civic leaders throughout the state and secured the support of the Minnesota Federation of Women's Clubs and the Minnesota Federation of Architectural and Engineering Societies, also of the newspapers of both St. Paul and Minneapolis, with the result that the Building Commission gave up its right to select the site and referred the matter back to the State Legislature.

At a meeting on March 30, the Building Commission definitely located the office building in accordance with the mandate of the Legislature and in accordance with the Cass Gilbert Plans for Capital Approaches prepared at the request of the city of St. Paul and as published in the Plan of St. Paul. Condemnation proceeding on the land has already begun.

The location of the office building faces the axis of the Capitol; makes the office building a companion to the State Historical Building, which has already been constructed; and forms the nucleus for a remarkable grouping of public and semi-public buildings along an axial approach which the Capitol faces. The building will be faced with granite.

GEORGE H. HERROLD,
City Planning Engineer.

An Indoor Rifle Range

PARKERSBURG, W. VA.—The intense interest in hunting, turkey shoots and shooting by the men in this vicinity brought to our attention consideration of an indoor winter rifle range. The School Board granted us use of the gymnasium located under the High School stadium. It is approximately 50 feet wide by 100 feet long. We had five large targets constructed with ⅛-inch steel background. The targets are 3 feet high, 30 inches wide and 3 feet deep. The front covering is beaver board. The targets were set on the floor against the concrete wall. We then had small targets printed, which were fastened to the beaver board with thumbtacks.*

We purchased five Winchester—22 caliber—repeating target rifles. However, contestants are allowed to use their own rifles, providing these are 22 caliber. Shells are purchased by the Board of Recreation at wholesale price and sold to the participants at less than the regular retail price. The men save money and the Board of Recreation is enabled to make a little profit, which is used for the purchase of awards for the winners in the various leagues and classifications.

The men who participate are organized into teams through the various industrial concerns and business houses. During this past winter, four leagues were organized, seven teams in each league and five men to a team.

The regulation shooting distance is 50 feet. Each man is given five practice shots, ten shots from a prone position, and ten from a standing position. A total of twenty official shots is made by each competitor for a possible score of 100 per cent.

D. D. HICKS,
Superintendent, Board of Recreation.

* See illustration in The Municipal Index, 1931, page 744.

More Billboard Control

WASHINGTON, D. C.—Under the terms of an act of Congress passsed at its recent session, the Commissioners of the District of Columbia have power to grant or withhold permission for the placement of advertising on public streets, and also on private property "in public view." The constitutionality of the latter provision was questioned by Senator Blaine, of Wisconsin. Senator Robinson, of Arkansas, however, declared that the insertion of a provision declaring the bill to be in the interest of "public health, morals, safety and welfare" probably would safeguard it from successful attack.

The measure as passed by Congress, therefore, contains this police power provision. The District Commissioners have appointed a committee of District officials which is charged with making a complete and extensive survey of existing signs of all types, including billboards, in all police precincts, with a careful check as to the authority for their existence. Licenses will be issued to all persons or firms who may be authorized to engage in the business of placing, erecting, hanging, painting, displaying and maintaining any sign or outdoor display in the district.

After the public hearing and the adoption of new sign regulations, the rules will be distributed to police precincts in pamphlet form, and the billboard rules will be made a subject of instruction at the police school, in order to insure the cooperation of the Police Department in enforcing the new law. The membership of the committee includes the Assistant Engineer Commissioner, Inspector of Buildings, Chief Clerk of the Engineer Department, and a representative from the Corporation Counsel's office and one from the Police Department.

REXFORD L. HOLMES.

Montreal Photographic Show Aids Cause of Civics—Pioneer Plan of Its Kind Launched in Canada

IN order to present in a vivid way the marked progress of Montreal and to stimulate civic pride and civic responsibility, the City Improvement League sponsored the Greater Montreal Civic Photo Show, which was inaugurated recently in the Dominion Square Building. The exhibition was open for five weeks and was visited by 15,000 citizens, of whom 6,000 signed daily attendance contest coupons. The admission was free. The English and French newspapers carried copious advance notices of the event and splendid critical appreciations later on. A section devoted to Montreal maps, plans, and models was a complementary attraction.

The Hon. H. G. Carroll, Lieutenant-Governor of the Province of Quebec, extended his patronage. The city of Montreal on the opening night, January 24, gave a civic banquet in the Windsor Hotel. This was attended by the leaders in the civic, political, commercial, cultural and religious spheres; and at this function Alderman Henry Auger, pro-Mayor, was the recipient of a gold key which he later utilized in opening the show in the Dominion Square Building, just across the street from the hotel.

The preliminaries took eleven months of intensive collection effort on the part of the League's secretariat. Only photographs taken from 1928 to 1930 were accepted. These included 8 x 10 glossy prints and commercial enlargements. There was a total of 1,350 ground, aerial, indoor and outdoor, photographs of all major activities and buildings of importance. All photographs were numbered, and a hand-written catalog supplied detail such as owners, architects, contractors, etc. The photographs were masked on cream-colored board and applied to the panels by means of wooden strips firmly attached with screws, all of which was placed in position on 35 specially made mahogany-stained, four-ply veneer, demountable panels with surface size of 40 inches by 90 inches. These were so built in order that they might be placed where daylight and electric light could best show-up the photographs. The entire cost of the exhibition was borne by the League, and the creation and execution of the program was left to the members of the Citizenship Committee, who called in experts to counsel its work.

In connection, a series of four free public lectures was given by the Chairman of the Citizenship Committee, and a final lecture on "Magnetic Montreal" by W. E. Gladwish. The titles of the four lectures were: (1) "Looking at Our City Through the Camera's Eye"; (2) "How to Appreciate and Judge Pictures"; (3) "In Search of Montreal"; and (4) "Production and Distribution in Montreal." All lectures were illustrated by lantern slides and motion pictures. Thousands of booklets on Montreal were distributed. These were donated by Montreal firms and governmental interests.

At the termination of the show many of the exhibitors donated their photographs on view, and from these the League is preparing lantern slides which will be used for lectures on Greater Montreal. Negotiations are now under way whereby these lectures and slides will be exhibited in the schools and thus advance the cause of the study of urban sociology and civics.

A. J. LIVINSON,
Chairman of the Citizenship Committee.

Police and Firemen's Salaries in New York State Cities

THE closing days of the 1931 session of the New York State Legislature witnessed a determined effort by organized policemen's and firemen's associations to effect the passage of a law making it mandatory for all cities to pay their policemen and firemen a minimum salary of $2,500 a year. This bill failed to pass the Legislature. If it had passed, it would have cost the cities of New York State $2,500,000 additional for salaries of policemen and firemen, not including the increased cost of adjusting the salaries of the chiefs, captains, and lieutenants and the increased cost for firemen's pensions. The bill was defeated through the cooperative effort of the cities and the New York State Conference of Mayors.

In New York State the salaries of policemen average about the same as those of firemen in most cities, except in some of the smaller municipalities where there are volunteer fire departments. Eleven cities and 40 villages out of 110 municipalities have volunteer fire departments In all except a few of these volunteer departments, the members receive no salaries, except that a small salary is pa'd to fire chiefs, drivers of fire apparatus, mechanics and fire-alarm operators.

The 1931 schedule for firemen in the cities having paid departments shows that a maximum salary of $3,000 a year is paid in two cities in close proximity to New York City, where the maximum salary is also $3,000 a year. In two cities, also near New York City, the maxium salaries paid is $2,500 annually. In eleven cities the maximum salary ranges from $2,000 to $2,250; in this group are included Buffalo, Syracuse and Rochester, three of the largest cities in the state. In 20 cities the maximum salary ranges from $1,700 to $1,900 a year; and it is less than $1,700 a year in 20 cities, most of these being volunteer departments. The lowest salary paid is $1,260 a year, in Ogdensburg.

The 1931 salary schedule for policemen shows that the maximum salary is $3,000 a year in New York City and in two nearby cities. In three cities the maximum salary ranges from $2,700 to $2,800, all of these being close to New York and one of them being the second smallest city in the state. In fifteen cities the maximum salary ranges from $2,000 to $2,500; in three cities, $1,900; in fifteen cities, $1,800; in seven cities, $1,700; and in thirteen cities, from $1,440 to $1,600. The lowest salary is $1,440, in Norwich.

It is an interesting fact that the amount of the salaries paid policemen and firemen in cities, while depending somewhat upon the size of the municipality, is more strongly affected by the proximity to New York City.

E. D. GREENMAN.

H. G. Wells Sees Rebuilding of Cities as Cure for Unemployment

OPENING an exhibition of modern transport at the Royal Institute of British Architects, H. G. Wells, as reported in a special cable to *The New York Times* of April 22, envisioned a time when towns would rebuild themselves as men visit tailors for new suits of clothes, thus providing in the process work for all.

"Recently I have been studying economic conditions," Mr. Wells declared, "and I am enormously impressed by the fact that what we used to consider the necessities of mankind are being produced by a smaller and smaller proportion of active workers. We have a growing mass of unemployed people for whom work must be found.

"I don't believe that private buying is going to employ the masses of the people again. New forms of employment must be found. The obvious thing is to consider the immense architectural possibilities. We must accept the responsibilities of rehousing all mankind, rebuilding every city in the world and reclaiming roads and countryside.

"This is not a utopian idea. It is a plain necessity. If we don't engage upon such an enormous collective enterprise, I can see nothing but social disaster ahead."

Municipally Owned Land for Housing and Farms in Spain

COMMUNALLY owned land expropriated from the aristocracy will be used for setting up a "cooperative system of peasant proprietorship" under a scheme to be put into immediate effect by the provisional republican government of Spain, according to Fernando de Los Rios, the new Minister of Justice. Recompense will be granted "on a reasonable basis."

"A start will be made this week on the enormous task of internal colonization by the drafting of trial leases whereby municipalities will be vested with title to land," Señor de Los Rios told a correspondent of the *New York Herald Tribune* on April 19, according to a copyrighted cable article appearing in that paper the following day.

Russian communism will not be copied, though the communal farm and state farm systems have been carefully studied by Señor de Los Rios. He says: "These systems would not be suitable for Spain, as the Spanish psychology is so different from the Russian. Our system will have its roots in centuries-old Spanish tradition. . . .

"Until the middle of the nineteenth century a great deal of the land in Spain was held in common by the municipalities At that time a movement to enclose large holdings of land took place in Spain, as it had in England during the preceding century. There still remain, however, some municipalities in the province of Leon which possess land in common.

"Where you have municipal ownership, you have no pauperism. We are going to make the municipalities owners and beneficiaries of the land as a sort of holding company whose members will be the workers on the land. The present owners of large states will be deprived of the chief portion of their holdings. They will be recompensed at a fair rate, which will be fixed by the government. . . .

"Land belonging to the Church will not be touched. The Church, however, is not one of the great landed proprietors.

"In the north, especially in Galicia, we have a problem entirely different. There land is held in tiny parcels which are too small to support a single family each. These holdings will be fused under communal ownership. In this way the land will support a much larger population than its does at present.

"By the time the Constituent Cortes assembles, the expropriation of land will be well under way. This is a matter whereon the republican parties are agreed. Hence, continuation of the project is assured, no matter what party wins the parliamentary majority."

Winning and Honor Cities, 1930 Health Conservation Contest

THE Board of Judges in the National Inter-Chamber Health Conservation Contest conducted by the Chamber of Commerce of the United States with cooperation of the American Public Health Association, on April 8, announced awards as follows:

Class I (Over 500,000 Population)
Winner—Detroit, Mich.
Honor Cities
Milwaukee, Wis. — Baltimore, Md.
Philadelphia, Pa. — Buffalo, N. Y.
San Francisco, Calif.

Class II (250,000 to 500,000)
Winner—Newark, N. J.
Honor Cities
Cincinnati, Ohio — Denver, Colo.
Rochester, N. Y. — Memphis, Tenn.
Kansas City, Mo.

Class III (100,000 to 250,000)
Winner—New Haven, Conn.
Honor Cities
Syracuse, N. Y. — Utica, N. Y.
Yonkers, N. Y. — Reading, Pa.
Hartford, Conn.

Class IV (50,000 to 100,000)
Winner—Racine, Wis.
Honor Cities
Harrisburg, Pa. — Durham, N. C.
Evanston, Ill. — Pasadena, Calif.
East Orange, N. J.

Class V (20,000 to 50,000)
Winner—Alhambra, Calif.
Honor Cities
Salem, Ore. — Watertown, N. Y.
White Plains, N. Y. — Fargo, N. Dak.
West Orange, N. J.

Class IV (10,000 to 20,000)
Winner—Chestertown, Md.
Honor Cities
Sidney, Ohio — Palo Alto, Calif.
South Orange, N. J. — La Salle, Ill.
Albany, Ga.

Housing Betterment Undertaken in Massachusetts

HOUSING betterment work to be begun in Metropolitan Boston, and in other municipalities of the state, to be carried on in each as long as necessary and then transferred to a local association, is proposed in the program adopted by the Massachusetts Housing Association at its annual meeting on March 17.

The Housing Association is an organization incorporated by the trustees of a fund left by George E. Henry, of Winchester, Mass., five years ago "for the improvement of housing conditions" in the state. The program, drafted by John Ihlder, recognizes the unique opportunity of a state organization that does not need to appeal to a state-wide constituency for funds.

The intentions of the Association are to improve housing conditions in every practicable way.

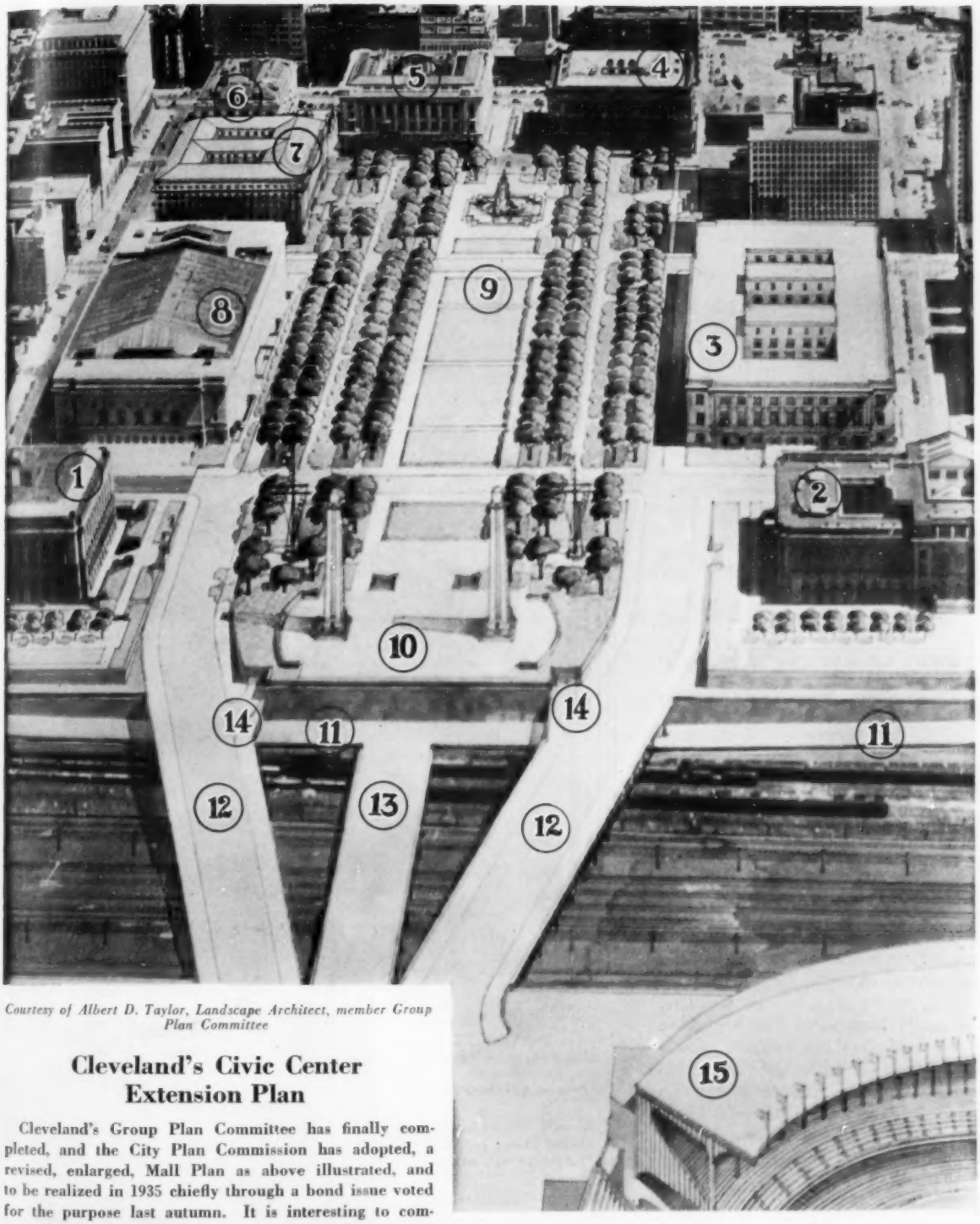
The Directors are Charles F. Dutch, President; C. Freeman Olsen, Treasurer; Stoughton Bell, Albert M. Chandler, Mrs. George E. Henry, John M. Kingman and Mrs. Eva Whiting White. John Ihlder is Executive Director, dividing his time between Boston and Pittsburgh.

John B. Bennett Passes On

MEMBERS of the publishing and advertising fraternity who were fortunate enough to be numbered among the friends of John B. Bennett were saddened to learn of his death at St. Petersburg, Fla., on April 9. His important position with the McGraw publications in their earlier stages of development, as well as his later connection in a managerial capacity with the David Williams Company and the United Publishers Corporation, brought him into contact with many of the largest business paper advertisers in all parts of the United States, all of whom held him in the highest regard, not only for his keen business judgment, but also on account of his sterling integrity and friendly dependability, which could always be counted upon in personal as well as in business relations. John B. Bennett was the type of man who will be held in loving remembrance by his associates for many years after he has ceased to move among them. He is survived by his widow and two sons, Reo Bennett, of Brazil, S. A., and Harold Bennett, of Rochester, N. Y.

World's Largest Diesel Engine for Danish City

THE municipal electric plant of Copenhagen, Denmark, will contain an eight-cylinder diesel engine having a total horsepower of 22,500, making it the largest in the world, according to a recent issue of *Diesel Power*. It is expected that the engine will be of the airless-injection, uniflow-scavenging type. Each double-acting, two-cycle cylinder will have a continuous full-load rating of over 2,800 b. hp., unprecedented in commercial work. This diesel Leviathan will be direct-connected to a 6,000-volt, 15,000-kw. alternating-current generator.



Courtesy of Albert D. Taylor, Landscape Architect, member Group Plan Committee

Cleveland's Civic Center Extension Plan

Cleveland's Group Plan Committee has finally completed, and the City Plan Commission has adopted, a revised, enlarged, Mall Plan as above illustrated, and to be realized in 1935 chiefly through a bond issue voted for the purpose last autumn. It is interesting to compare the plan of 1902 and the Committee's former proposal (see THE MUNICIPAL INDEX, 1930, page 160) with this. Present and proposed structures shown are:

1. City Hall
2. County Court House
3. Proposed building
4. Post Office Building
5. Public Library Building
6. *Plain Dealer* Building
7. Board of Education Building (under construction)
8. Public Auditorium
9. Central area of future Mall
10. Memorial Plaza
11. Superhighway
12. Ramps leading to stadium
13. Bridge to stadium
14. Entrance to upper level of proposed Exhibition Hall
15. Stadium on the lake front, now under construction

"THE MODERN WAY TO USE ASPHALT"

for durable wearing surface, armor coat, full penetration pavement, cold pre-mix, retread, road mix, and maintenance . . . . . .

Permanently non-skid . . smooth-riding . . and durable. No bleeding, shoving or corrugating. Answers the demand for a better asphalt pavement. Simple construction methods . . no heating. Applied cold, at any temperature above freezing, or in mildly wet weather. Less costly than any other high-type pavement of equal thickness. Write for set of Bitumuls bulletins, with complete facts on "The Modern Way to Use Asphalt". American Bitumuls Company, Dept. 4, 200 Bush Street, San Francisco.

1. Near Baltimore, Maryland —Old Annapolis Road, Bitumuls Penetration Wearing Surface on old concrete base.

2. Weston, Massachusetts, — B. Loring Young estate. Bitumuls Armor Coat, on drives.

3. Bitumuls for maintenance,— using air pressure. Anaheim, California.

BIT-U-MULS

Factories and Offices: BOSTON, BALTIMORE, CINCINNATI, ST. LOUIS, BATON ROUGE, LOS ANGELES, PORTLAND, ORE. *Executive Offices:* SAN FRANCISCO

THE TAXPAYER'S DOLLAR

A Monthly Department of Budgeting, Assessment, Taxation, Accounting and Other Phases of Municipal Finance Conducted by A. E. BUCK, National Institute of Public Administration, New York

Tax Machinery Breaking Down in Ohio

THE Citizens' League of Cleveland declares that the tax machinery of Ohio is breaking down and that immediate legislation is necessary to prevent a total collapse. Its assertion is based on the research work of Professor Arthur E. Nielsen of Oberlin College, who has presented a summary of his findings after a survey of the situation in the 88 counties of Ohio for the Governor's Taxation Committee. The facts as cited are as follows:

The net amount of taxes levied on real estate in 29 counties for 1928 which was not collected in the two tax periods amounted to $8,330,000, or 8.4 per cent of the total levy. The unpaid personal taxes of the 1928 levy in 44 counties totaled $2,125,000, or 3.6 per cent of the levy. The unpaid special assessments of the 1928 assessment levy in 13 counties amounted to $3,370,000, or 19.6 per cent of the asssessment charges. Taxes and assessments delinquent for four years in 38 counties totaled $7,900,000. The tax delinquencies in the state have increased from $8,000,000 in 1920 to $36,000,000 in 1928, an average annual increase of 20 per cent. In Cuyahoga County alone, accumulated delinquent taxes and assessments have increased from $4,649,100 in 1921 to $29,117,045 in 1929.

Professor Nielsen holds that the county auditors and county treasurers are largely responsible for the situation because of their failure to observe the requirements of the law. The law requires the county auditors to certify delinquent parcels after each tax collection and to advertise the delinquencies in a newspaper of general circulation. In several counties this is done either improperly or not at all. Foreclosure proceedings break down between the auditor and the treasurer or in the courts in a great many counties. Where such proceedings are undertaken, experience shows that the sale of delinquent lands has seldom equaled the amount of the taxes, assessments, penalties and interest on the parcels sold.

New York City Fixes Tax Rate for 1931

ON March 2, the Board of Aldermen of New York City, in a special statutory session, formally fixed the tax rate for 1931 at $2.57 on every $100 of taxable assessed valuation. The basic rate, as adopted, is 12 cents below the rate of $2.69, which was estimated by Comptroller Charles W. Berry as the indicated basic rate before legislation was passed in Albany, on his recommendation, making it possible to add to the city's general fund certain sinking-fund surpluses. Even with this abatement, the basic rate for 1931 is 4 cents higher than that of 1930, which was $2.53. Including the assessments for local borough improvements, which are collectible with the taxes on real estate, the combined basic levies with the borough assessments will be as follows in each of the five boroughs: Manhattan, $2.72; The Bronx, $2.61; Brooklyn, $2.62; Queens, $2.69; and Richmond, $2.68.

The assessment rolls for the current years transmitted to the Board of Aldermen on March 2, by the Department of Taxes and Assessments, set forth the following valuations by boroughs: Manhattan, real estate, $10,031,191,787, personal, $254,391,200; The Bronx, real estate, $2,049,577,747, personal, $24,607,850; Brooklyn, real estate, $4,294,335,301, personal, $80,100,200; Queens, real estate, $2,123,818,178, personal, $15,179,990; Richmond, real estate, $307,243,911, personal, $2,070,850. The real estate aggregates $18,806,166,924 and the personal $356,350,090, making a total for the whole city of $19,162,517,014.

The city budget for 1931, as enacted last December, amounts to $620,840,183.37. Of this total, over $492,275,000 must be raised by direct property tax.

Municipal and County Debt Studied in New Jersey

THE Commission to Investigate County and Municipal Taxation and Expenditures in New Jersey recently issued Report No. 2 on "Municipal and County Debt." This report consists of 138 pages and treats the following topics: description of municipal and county debt; statutory debt limitations in theory and practice; debt terms and redemption; public improvement planning and budgeting; and other matters of debt administration. It continues the discussion of local finances which was begun in Report No. 1 on the "Organization, Functions and Expenditures of Local Government."

The Commission finds that local debt management is in need of thorough and extensive reform. It asserts that the people of New Jersey have been living in a "fool's paradise" so far as local financing is concerned. Facts and figures are produced to bear out this assertion. To meet this serious situation, the Commission recommends not only statutory changes but also a different viewpoint with respect to the use of public credit which will compel the localities to count the cost at the time the indebtedness is incurred.

Two changes are suggested to effect this end. One is the preparation and adoption of an improvement budget for capital expenditures. It is proposed that this budget be prepared and adopted at the same time the budget for current operations is set up. It is suggested that it contain a detailed program of capital expenditures which the governing body proposes for the coming year, and that it should indicate the sources of the funds to be used—whether from taxation, from loans previously authorized, or from new loans to be subsequently issued. With respect to all new loans, statements should be set up showing the amount by which taxation must be increased during the life of the loan in order to finance it.

The second change proposes that for every loan authorized there shall be budgeted in the first year an amount equal to the largest annual debt service payment. The Commission thinks the taxpayer should have this rude awakening at the very outset rather than some years later. By this procedure, it believes the public will become "debt conscious." The Commission asserts that "municipal borrowing in New Jersey has outdone anything ever thought of in the private installment business, since no down payment is required, and none need be made for upwards of two years, while the interest on the entire loan during the period of construction and for six months thereafter may be treated as part of the original cost and included in the amount to be borrowed."

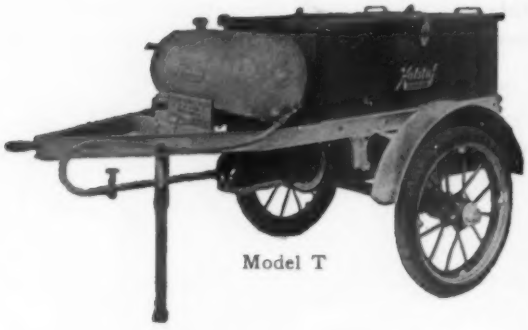
The Commission's plan for limiting the aggregate amount of debt which a municipality or county may incur contemplates the repeal of a mass of legislation which grants exemptions and special credits and has destroyed the effectiveness of the limits that are stated in the bond act. Under the proposed plan, the 7 per cent limit for municipalities and the 4 per cent limit for counties would become real, so far as the debt to be retired by future taxation is concerned. Valuations on which taxes are in arrears, or under appeal, would no longer increase the limit.

Proposal to Improve Special Assessment Procedure in California

SPECIAL assessments to finance public improvements have become quite a burden in many communities in California, so much so that the taxpayers have demanded some form of relief. In response to this demand, a legislative commission was appointed to study the situation. Several agencies assisted this commission, notably the California Taxpayers' Association, California League of Municipalities, California Real Estate Association, and Los Angeles Chamber of Commerce. These agencies, working through a joint committee, drafted a bill, which was introduced and is now pending in the State Legislature.

The bill, which is called the "Special Assessment Investigation and Limitation

Investigate These Big Money-Savers!



Model T

Hotstuf

TRADE MARK REG.

30% greater melting capacity
30% less fuel

HOTSTUF Asphalt Heaters are offered on their production capacity, rather than holding capacity.

You are interested in how much hot asphalt a heater will deliver, heated up to the temperature you want it, not how much it will hold.

The Patented Elevated Melting Chamber Feature around which all Mohawk Hotstuf Heaters are built will produce a continuous flow of hot asphalt within fifteen minutes after lighting the torch, at a rate better than thirty per cent faster with approximately thirty per cent less fuel consumption than other makes of the same rated holding capacity.

We welcome an opportunity to prove this on your job.

Five different capacities made in five different models to choose from.

Ask for Catalogue!

MOHAWK HI-SPEED TRAILER

TRADE-MARK

Let your trucks carry Pay loads — not tools!

DON'T tie up a truck to carry tools. Every time one of your trucks carries tools it cheats you out of pay load. Trail the tools to the job in a Mohawk Hi-Speed Tool Trailer.

When you have one of these convenient, waterproof, all steel Mohawk Hi-Speed Trailers, you can count on having your tools always on the job and in safe keeping at night.

They are made to stand the gaff. All Steel, extra-heavy welded, half-elliptic springs, rubber tires, roller bearings. Special partitions and compartments for all tools.

Made in sizes and designs to suit every condition, and can be trailed at truck speeds.

There's a place for every tool — keep every tool in its place.

Ask for Catalogue!

MOHAWK ASPHALT HEATER COMPANY

SCHENECTADY *Dealers in Principal Cities* NEW YORK

Act of 1931," sets down a procedure which the legislative body of the city or county involved must use in proceeding with any public improvement, financed through special assessments. This procedure does not apply to flood control, irrigation, reclamation, sanitary, or other districts which constitute public corporations, nor does it apply to the financing of public improvements through bond issues, since the taxpayers are supposed to be adequately protected in these respects at the present time.

It appears that the bill carries workable provisions relating to preliminary investigation, public hearing after report on investigation, notice by mail, and written report of hearing. Some doubt may be expressed on the provisions with respect to assessment limits in view of the fact that experience in other states under similar provisions has not been very successful. The attempt to define true value in the bill is open to difference of opinion as to its workability. Nevertheless, the bill, if enacted either in its present or in a slightly modified form, may do much to improve the existing situation in California.

Boston Budget Presented to City Council

ON March 16, Mayor Curley presented to the City Council, a budget for the governments of Boston and Suffolk County which totaled $38,957,838. In connection with the budget, he submitted a message in which he explained that he had reduced the original estimates of departments by more than $5,000,000 in an effort to keep taxes down and yet provide for needed expenditures. The budget for 1931 is about $2,000,000 more than the budget of 1930. In preparing the budget, Mayor Curley had the assistance of Charles J. Fox, who has been City Budget Commissioner for several years.

Although the fiscal year of Boston coincides with the calendar year, the appropriations for the year are not usually made until about four months have elapsed. Under an old state law passed in 1889, each city department may expend prior to the making of appropriations "one-third the entire amount appriated for the department for the previous year." Under normal conditions this allows the department to function for approximately the first four months of the year. This makes it necessary for the city council to pass the appropriations by about May 1 of each year. But the mayor cannot submit his budget to the city council until the State Legislature has fixed the annual tax limit for the city. If the Legislature delays in doing this (and it usually does), the mayor's budget may be presented very much later than it was this year, sometimes after the middle of April. Thus the council is compelled to act on the budget in a very short time, considering the amount of money involved. When the council has been unable to enact the appropriations before the statutory limit was reached, the departments have had temporarily to suspend payrolls and to curtail their activities. Apparently this situation will be avoided during 1931 by the early presentation of the budget, a month and a half before the limit has been reached. It may be of interest to observe that the State Legislature again fixed the annual tax limit at $16 on the $1,000 of assessed valuation, as in 1930.

Budgetary Improvement Recommended for Philadelphia

THE proposal for an $8,000,000 emergency loan for Philadelphia prompted the local Bureau of Municipal Research to recommend a better budgetary procedure for that city. The Bureau says that the city's recurring deficits in the past, and the consequent use of emergency loans, have been due, at least in part, to the inadequate information in Council's possession at budget-making time.

The Bureau recommends that the mayor, as the city's chief executive, should prepare the budget, and that it should express the mayor's views regarding the expenditure and revenue needs of the city for the ensuing fiscal year. To enable the mayor to do this work, the Bureau says that he should have the assistance of a budget staff and an able budget director. It insists, and quite correctly, that budgeting is a year-round task, and not a hurried clerical job to be completed in a few weeks.

St. Louis Reported Two Million Dollars in the Red

THE Bureau of Municipal Research of St. Louis reports that city to have a deficit of $2,000,000. Deficits have been the usual thing in St. Louis during the past ten years, but this one is the largest of any year, amounting to practically 10 per cent of the total revenues. It is attributed both to the failure to realize certain anticipated revenues and to overexpenditure of appropriations.

To prevent such deficits, the Bureau suggests conservative estimating of revenue in the budget; control of appropriations by an allotment system on a monthly or quarterly basis; the practice of rigid economy by department heads, who must cut down expenditures to fit their necessary requirements. The Bureau believes that the city's sources of revenue are inadequate and that this problem must be taken up and studied carefully.

Milwaukee Makes Land Value Assessment Maps Available

THE Citizens' Bureau of Milwaukee reports that the first published book of land value assessment maps for that city is now available for free distribution. The book consists of 19 maps, representing the tentative 1931 land assessment of each district in the city in terms of front-foot value for every parcel of land on every street. With the aid of these maps and the table of unit values listed according to the depth of the lot, each landowner may check his own assessment and compare it with the assessment of similar property throughout the city. The plan is to publish the current assessment annually.

The Bureau asserts that this is a commendable step on the part of the city tax officials, and points out that only four other cities have undertaken the publication of unit value maps. These are Cleveland, Detroit, New York, and San Francisco.

Milwaukee is using a unit foot land value table adopted over 20 years ago by which lots are assessed according to depth factors on a unit value for 100 feet deep in business districts, and 120 feet in residence districts. The Bureau reproduces the depth units, which are quite similar to those of Detroit and Cleveland.

Madison, Wis., Follows a Form of "Pay-As-You-Go"

MAYOR A. G. SCHMEDEMAN, of Madison, Wis., in a recent statement, explains the modified plan of "pay-as-you-go" which is being followed in that city. He says that if the city government attempted to meet all of its capital requirements out of its current budget, the tax rate would be prohibitive. Instead of doing this, Madison is attempting to work out a policy which will provide for the issuance of bonds only for the financing of long-time improvements of a major character. Other improvements are financed by direct tax.

It had been the practice in Madison to carry balances of over $1,000,000 in the local banks from the time the taxes were collected until the latter part of the year when this money was needed to meet current expenditures. At the same time, bonds were being issued to finance various capital expenditures. Mayor Schmedeman decided that the issuance of necessary bonds should be deferred until the latter part of the year, and that the capital expenditures prior to obtaining money from bond issues should be financed from the money on deposit. This has saved interest on the bonds at approximately 4½ per cent and used money that would otherwise earn interest at only about 2 per cent.

Improved Assessment of Real Estate for Local Taxation Purposes

THE Taxation Division, Finance Department of the Chamber of Commerce of the United States, Washington, D. C., has issued a 35-page pamphlet on the above subject prepared by Morris Edwards, of the Taxation Division staff, with the assistance of the Committee on State and Local Taxation and Expenditures.

While the pamphlet necessarily presents an elementary and brief treatment of assessments, it is well arranged and clearly written. It ought to have a wide reading by business men interested in the subject.

"Pittsburgh-Des Moines" Incinerators for the Smaller Communities

Coraopolis, Pa. is *a clean community* ten miles northwest of Pittsburgh on the Ohio river. It had a 1930 census of 10,718. In 1929 the municipal officials called on "Pittsburgh-Des Moines" for an adequate garbage disposal plant.

The modern incinerator illustrated below now disposes of all the town's garbage and rubbish every day. It is efficient, economical, smokeless, odorless and simple to operate. Its rated capacity is 35 tons every 24 hours.

Small villages and towns have also discovered the advantages of scientific incineration for garbage and refuse disposal. This modern disposal method is available at a cost they can easily afford.

Some of the outstanding advantages of the "Pittsburgh-Des Moines" incinerator plant are:

1.

A dependable economic performance record at 1500° Fahrenheit or above

2.

The utilization of all the garbage as fuel—resulting in big fuel savings and low operating costs

3.

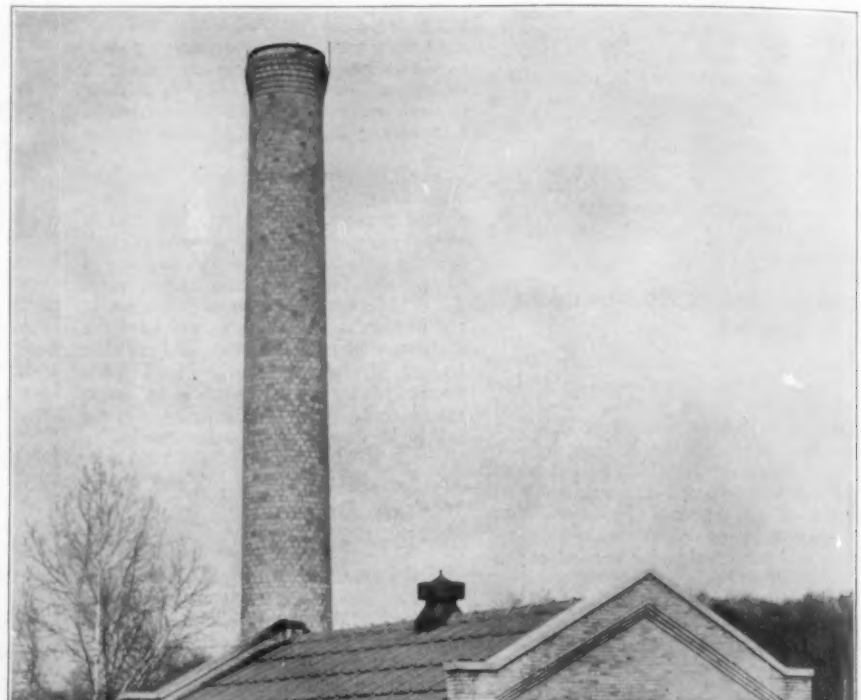
Selective charging of fresh garbage to any cell of the furnace

4.

Short and easy "all pull" stoking

5.

Simplicity of operation and foolproof construction



Interested municipal officials should write to the nearest office for our new Incinerator Catalog describing the PDM Mutual Assistance Type of Furnace

Pittsburgh-Des Moines Steel Company

Room 941, 270 Broadway, New York N. Y. **3452 Neville Island, Pittsburgh, Pa.**

Des Moines **San Francisco** **Seattle** **Chicago** **Atlanta** **Dallas**

TRAFFIC CONTROL AND FACILITATION

Conducted by the Institute of Traffic Engineers, 175 Fifth Avenue, New York

Publications Committee: Maxwell Halsey, Chairman, Hawley S. Simpson, Harry H. Hemmings, Arthur G. Straetz

Institute Elects New Members

AT a meeting of the Board of Direction of the Institute of Traffic Engineers, held April 6, 1931, nineteen new members were elected, bringing the total membership of the Institute to fifty-three.

The new Members are:

William H. Baker, Jr., Traffic Engineer, County of Los Angeles, Calif.

J. W. A. Bollong, Traffic Engineer, Seattle, Wash.

Leon R. Brown, Safety Engineer, New York State Railways, Rochester, N. Y.

Ralph W. Eaton, Providence, R. I.

John P. Hallihan, Chief Engineer, Rapid Transit Commission, Detroit, Mich.

Reyburn P. Hoffman, Secretary-Manager, St. Louis Safety Council, St. Louis, Mo.

Lewis W. McIntyre, Traffic Engineer, Pittsburgh, Pa.

John M. Rice, Consulting Engineer, Pittsburgh, Pa.

Associate Members elected are:

Kenneth M. Hoover, Traffic Engineer, Brooklyn and Queens Transit Corporation, Brooklyn, N. Y.

Donald M. McNeil, Assistant Traffic Engineer, Pittsburgh, Pa.

Walter F. Rosenwald, Maintenance Engineer, Minnesota State Highway Department, Minneapolis, Minn.

Thomas J. Seburn, Traffic Engineer, Kansas City, Mo.

Arnold H. Vey, Traffic Engineer, State of New Jersey, Trenton, N. J.

Invitations were extended to the following to become Affiliate Members:

Henry M. Brinckerhoff, Consulting Engineer, New York City.

Arthur M. Gaboury, Secretary-General, Province of Quebec, Safety League, Quebec, Que.

Fritz Malcher, Traffic Consultant, New York City.

L. E. Peabody, Economist, United States Bureau of Public Roads, Washington, D. C.

Lloyd P. Rader, Assistant Professor of Civil Engineering, Brooklyn Polytechnic Institute, Brooklyn, N. Y.

Hon. Russell S. Wise, Chairman, New Jersey State Traffic Commission, Trenton, N. J.

The Institute of Traffic Engineers, through its Library Committee, plans to issue monthly a bulletin known as the *Traffic Digest*. This bulletin will contain mention of every important article that appears in the various technical publications.

Clean Signals in Pittsburgh

IT is common knowledge among traffic engineers that obedience to signals is frequently measured by their authoritative appearance. A dilapidated signal gives the motorist the impression that the community is lax in traffic matters and that he can probably get by with violations. Clean signals, on the other hand, impress the motorist with a feeling of positive control. This has been admirably carried out in Pittsburgh through the adoption of industrial methods in street traffic work by the Bureau of Traffic Planning, under the direction of Lewis W. McIntyre, Chief Engineer.

For many years, machines known as high-pressure jennies have been used in industrial plants to clean slippery floors and to make windows of illumination value. After a careful study of the requirements of such an organization as the Traffic Planning Bureau in Pittsburgh in its work of cleaning signs, painted curbs and the like, a plan was devised for placing such a machine on a truck and using it to shoot hot-water vapor under a pressure of 150 pounds onto the object to be cleaned.

THE POLISHING PROCESS
used on Pittsburgh signal lights

The device, novel in street traffic work, is planned both as a labor- and a paint-saving method of cleaning. The accompanying pictures show the "Hypressure Jenny" as manufactured by the Homestead Valve Manufacturing Co., Coraopolis, Pa.

1,250 Signals and 13,000 Stop Signs Guard New Jersey Intersections

THE New Jersey Traffic Commission has taken the first step in studying the traffic devices under its jurisdiction. It has determined the number and location of signals and stop signs in the state. These are shown in the following table:

	Traffic Signals	Stop Streets
Atlantic City	155	300
Asbury Park	100	4
East Orange	27	340
Elizabeth	34	166
Englewood	11	102
Hoboken	15	0
Jersey City	67	92
Kearny	12	140
Maplewood	12	59
Montclair	10	201
Newark	56	609
Nutley	1	122
Paterson	8	292
Plainfield	10	340
Somerville	7	58
South Orange	5	120
Teaneck	9	108
Trenton	71	370
Passaic	17	62

Signals and stop signs have come into prominence lately, since recent studies have shown that if they are not used properly they increase rather than decrease accidents. With the large number of these devices in New Jersey, it is apparent that the proper or improper application of them would materially influence the accident situation.

The Commission refuses to comment on the fact that the devices are not distributed according to traffic conditions or population, wisely reserving its opinion until it has had an opportunity to survey each municipality.

THE "HYPRESSURE JENNY"
An operator is here demonstrating its efficiency in cleaning signals to a group of western Pennsylvania and Ohio street traffic experts

SINCE 1867

COLDWELL POWER

Full particulars of the above and also the complete Coldwell line of power mowers on request

for Mowing Large Areas...

The new Coldwell Fairway Gang fills a long-felt need for a light-weight, strong and flexible outfit of large capacity for use on Golf Fairways, Parks, Estates, School and College Campuses and other large lawn areas.

The Gang complete weighs less than 500 pounds and may easily be drawn by any of the light-weight tractors or by one fair-sized horse.

The 21-inch cutting units are flexibly attached to the superstructure or frame work so that they oscillate freely in any direction and conform readily to the uneven surface of the ground. Thus the Coldwell Gang is particularly useful on hilly and uneven lawns.

Cutting widths 60 and 96 inches. Three and five-unit Gangs.

●

COLDWELL LAWN MOWER COMPANY, NEWBURGH, NEW YORK, U. S. A.
IN CANADA—TAYLOR-FORBES CO., LTD., GUELPH
Manufacturers of DEPENDABLE Lawn Mowers—HAND, HORSE, GASOLINE, ELECTRIC

Computing the Traffic Capacity of Streets and Tunnels

THE subject of highway capacities has undergone very little research in comparison to the great economic importance of the problem to the street builder and user. Probably the most comprehensive surveys have been made by the Regional Plan of New York and Its Environs and by Dean A. N. Johnson, University of Maryland.

The Regional Plan formula for maximum capacities of a single lane highway without grade crossings is:

$$N = \frac{5280V}{0.733V + 0.072V^2 + 15}$$

Dean Johnson's formula is:

$$N = \frac{5280V}{0.5V^{1.2} + 15}$$

In both equations:

N = the number of vehicles per hour per lane.
V = speed in miles per hour.

The maximum capacities and speeds at which they occur, as computed from the above formulas, are as follows:

Formula	Maximum Traffic in Vehicles per Lane per Hour	Speed in Miles per Hour
Regional Plan of N. Y...	1,880	15.0
Dean Johnson	2,880	34.5

These figures are recognized as being practically unattainable upon multiple-lane highways because of the friction induced by weaving. The Regional Plan of New York and Its Environs estimates that, for satisfactory driving conditions, the capacity of a multiple-lane highway uninterrupted by cross traffic or traffic signals is not more than 1,500 vehicles per hour per lane. Dean Johnson, in a report recently presented to the Highway Research Board, has again called attention to this point and suggests that perhaps even lower capacity figures ought to be sought for design purposes. These he would designate as "working" or "free moving" capacities, if some acceptable definition could be found.

He suggests that the "working" capacity is reached at the point at which following vehicles find it inconvenient to pass preceding slower vehicles. As the volume of traffic increases beyond this point, the number of vehicles passing in a given time will still increase, but the individual driver will have less and less freedom of action. The number of vehicles may increase until a point is reached where the total volume is at the "ultimate" maximum, which would immediately precede the condition of "incipient stagnation," to quote Dean Johnson.

Dean Johnson's observations were made to determine the relative "working" capacities of two-lane, three-lane and four-lane roadways, the observers being instructed as follows:

"Congestion is considered to occur on a road when the number of vehicles reaches a total great enough to fill the road and makes turning out impracticable; this condition to last a sufficient length of time to be noticeable, the minimum amount of time being one minute. When congestion occurs, reduction of speed will be noted, along with the tendency for drivers to crowd one another."

At none of the points on the four-lane roads was any congestion noted, but in all other cases congestion occurred a sufficient number of times to warrant the drawing of general conclusions, although the report states that more research must be conducted before it is "possible to form definite conclusions."

Using the term "congestion" as defined by Dean Johnson, the two-lane road was found to be practically free from congestion up to 1,000 vehicles per hour.

The three-lane road was found to be practically free from congestion up to 1,600 vehicles per hour, and to be congested not to exceed one-fifth of the time up to 1,900 vehicles per hour.

With further increases in the number of vehicles per hour, congestion was found to increase more rapidly on a two-lane road than on a three-lane road.

When four-fifths or more of the traffic is in one direction, the two-lane road is practically free from congestion up to 1,300 vehicles per hour, and the three-lane road up to 2,300 vehicles per hour.

M. O. Eldridge, Traffic Engineer, District of Columbia, recently submitted a report on Highway Capacities to the American Road Builders' Association based upon a study in the Holland Tunnel under the Hudson River between New York and New Jersey, which consists of two two-lane tubes, one for eastbound and one for westbound traffic. Fast traffic moves in the left-hand lane and slower traffic in the right-hand lane in each tube and, except when ordered by Tunnel police, a driver is not permitted to move from one lane to the other. The speed limit in the tunnel is set at 30 miles per hour and motorists are required to maintain a clear distance of 75 feet between cars, making the center to center spacing approximately 90 feet.

Based upon the average speeds found by Mr. Eldridge, the fast lanes can clear 1,860 and 1,995 cars per hour at 31.6 and 34.0 miles per hour, respectively, at the designated spacing. The speeds in the slow lane were found to be 15.1 and 16.7 miles per hour, which would discharge between 890 and 980 cars per lane per hour at the prescribed spacing, making the total capacity of each tube somewhere between 2,750 and 2,975 vehicles per hour.

The highest observed flow through the tunnel has been 2,507 cars in the westbound tube when there was but little commercial traffic. The capacity of the tunnel, as computed by Ole Singsted, Chief Engineer and Superintendent, is 2,540 vehicles per hour in each tube when the majority is passenger-vehicle traffic.

Because of the comparatively short length of the tunnel (less than two miles) and because traffic is confined strictly to its own lane, it is quite probable that the tunnel could be operated for short periods at the maxima computed by Mr. Eldridge, although "the delays incident to the purchase and collection of tickets and to the weaving of traffic from several lanes into two lanes so as to enter the tunnel" is probably the determining point in the capacity.

"White Collar" Unemployed Aid in Providence Traffic Survey

UNDER the sponsorship of the Providence Chamber of Commerce and with the support of the Providence Emergency Unemployment Committee, a comprehensive traffic survey was begun in that city on April 10. Ralph W. Eaton has been selected director of the survey.

This study will bring up to date the data secured in the traffic survey made in 1927-1928 and will obtain other information for the analysis of problems not dealt with at that time.

All-day traffic counts are to be made at about 140 intersections, and in addition two cordon counts at an inner and an outer ring are contemplated. Traffic speeds on main arteries in various sections of the city will be ascertained and analyzed in relation to unnecessary impediments to the traffic flow. A complete parking survey of the downtown districts is being made, analyzing the facilities and use of both street and off-street areas.

The curb-parking survey will record the time, location and registration number of every street-parked vehicle at intervals of fifteen minutes. These data will be analyzed by mechanical sorting and tabulating machines, particular attention being paid to the vehicles which park on downtown streets between 8 A. M. and 9 A.M. prior to the opening of business.

The survey is being financed by the Providence Emergency Unemployment Committee, which has secured a fund of $22,000 per week for sixteen weeks, made up equally of contributions by employers and by employees. Of this total, $7,000 per week is being spent in direct relief, and $15,000 for the employment of 1,000 persons, each receiving $15 for a 44-hour week. Many valuable public and semi-public projects have already been undertaken, of which this survey is the most recent. The traffic study was suggested as a needed project which would enable the so-called "white collar" class to obtain suitable employment.

Planned Highways and Intersections

The Municipal Index, 1931, contains a 21-page illustrated article by Burton W. Marsh, Traffic Engineer of Philadelphia, and Director of the Institute of Traffic Engineers, on "Planning Highway and Street Intersections for Modern Traffic Needs."

Reproduction from a painting made at "Wilpen Hall," the estate of Mrs. William Penn Snyder, Sewickley, Pa., by Frank Swift Chase

© The D. T. E. Co., Inc. 1931

There is true economy in Davey service

Davey Tree Surgeons live and work in your vicinity

Davey Tree Surgeons give you more service per dollar than any untrained or irresponsible men who may claim to work more cheaply per hour. There are very definite reasons for this fact.

Davey experts work with the assurance of scientific skill and successful experience, and without hesitation, guesswork, or loss of time. They are trained in the Davey Institute of Tree Surgery, the only school of its kind in the world.

No unnecessary work is permitted to be done by Davey Tree Surgeons. They are required by both organization discipline and professional training to do only those things which should be done in the client's interest.

JOHN DAVEY
1846-1923
Father of Tree Surgery
Reg. U. S. Pat. Office

No money is wasted by Davey experts on trees that are too far gone. Furthermore, those trees that are in questionable condition are given only first-aid treatment, until it has been demonstrated by the increasing vigor of the trees that an investment in full treatment is warranted.

Davey work is done right, both mechanically and scientifically. It has permanent value and does not need to be done over again. It saves trees that are capable of being saved.

All Davey experts are workers—no other kind are retained in the Davey Organization. Diligent effort and faithful performance are required and guaranteed.

The service of Davey Tree Surgeons is really local to you. They live and work in your vicinity. There is no charge for lost time—only for actual working time. There is no cost to you for carfare or any other extras except the materials that go into the work. Write or wire our nearest representative or home office in Kent, Ohio, for a free examination of your priceless trees without obligation on your part.

THE DAVEY TREE EXPERT CO., Inc.
622 City Bank Bldg., Kent, Ohio
In Canada—Davey Tree Expert Company of Canada, Limited—Toronto and Montreal
MARTIN L. DAVEY, *President and General Manager*

Branch offices with telephone connections: Portland, Me., Boston, Worcester, Springfield, Pittsfield, Providence, Hartford, Torrington, Westport, Stamford, New York City, White Plains, Patchogue, L. I., Hempstead, L. I., Albany, Syracuse, Rochester, Buffalo, Toronto, Montreal, Orange, N. J., Ridgewood, N. J., Madison, N. J., Philadelphia, Baltimore, Washington, Richmond, Pittsburgh, Cleveland, Toledo, Columbus, Dayton, Cincinnati, Indianapolis, Louisville, Lexington, Paducah, Detroit, Grand Rapids, Chicago, Milwaukee, Oconomowoc, Wis., Minneapolis, Des Moines, St. Louis, Kansas City, Mo., Charlotte, N. C., Atlanta, Birmingham, New Orleans, Tulsa.

There are no Davey Tree Surgeons except those in the employ of The Davey Tree Expert Company

DAVEY TREE SURGEONS

Traffic Fatalities to Children Decrease, Also Those Involving Commercial Vehicles

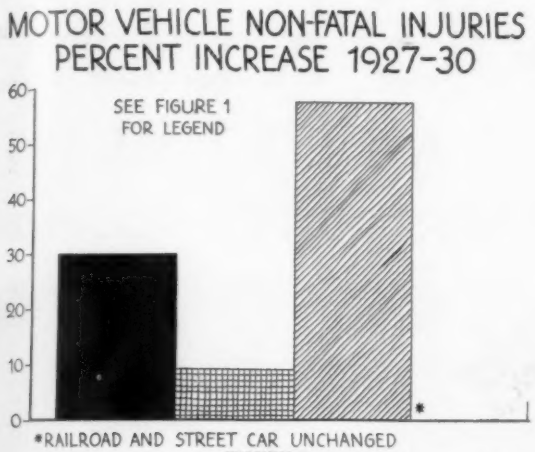


FIGURE 1

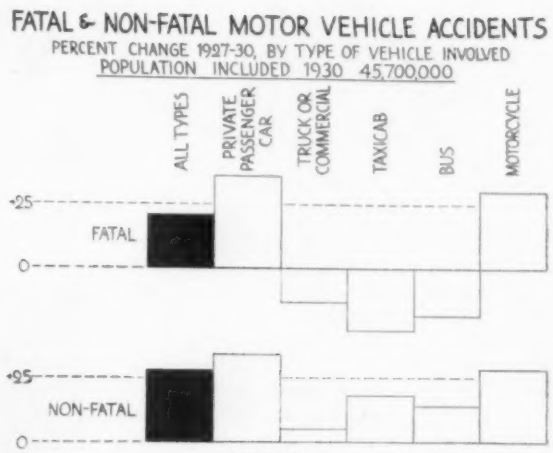


FIGURE 2

THROUGH the courtesy of the National Safety Council, three charts are here presented which are to appear in the forthcoming edition of "Accident Facts—1931." Figure 1 shows graphically the percentage of change in number of motor-vehicle fatalities from 1927 to 1930 reported by certain police and motor-vehicle departments representing a 1930 population of 48,000,000. During the three-year period covered by these statistics, motor-vehicle fatalities for all ages increased as follows: All types, 16.0 per cent; collisions with pedestrians, 4.9 per cent; collisions with other motor vehicles or fixed objects or non-collision accidents, 42.4 per cent; collisions with railroad trains or electric cars, 10.9 per cent.

A striking fact brought out by the charts is that there was a substantial decrease in fatalities among children under 15 years of age, while the higher age groups were showing substantial increases. These percentages for all types of fatalities (designated by solid black on the chart) are: 0 to 4 years, a decrease of 9.8 per cent; 5 to 15 years, a decrease of 19.2 per cent; 15 to 54 years, an increase of 28.2 per cent; 55 years and over, an increase of 29.3 per cent.

In Figure 2 the percentage of increase in non-fatal injuries for all age groups for the three-year period is shown. The figures are: all types, 29.7 per cent; collisions with pedestrians, 8.7 per cent; collisions with other motor vehicles or fixed objects or non-collision accidents, 56.6 per cent.

Figure 3 indicates the better showing made by drivers of commercial vehicles, taxicabs, and busses, as compared with drivers of private cars during the three-year period, the chart being based on reports involving a total population of 45,700,000. While fatal motor-vehicle accidents of all types were increasing 21.0 per cent, those for private passenger cars increased 36.6 per cent; but such accidents decreased 13.5 per cent for trucks and commercial vehicles; 24.8 per cent for taxicabs; 18.9 per cent for busses; and motorcycles showed an accident increase of 30.9 per cent. The corresponding figures for non-fatal accidents were: all types, an increase of 28.4 per cent; private passenger cars, an increase of 34.2 per cent; trucks and commercial vehicles, an increase of 5.4 per cent; taxicabs, an increase of 18.5 per cent; busses, an increase of 14.4 per cent; motorcycles, an increase of 28.4 per cent.

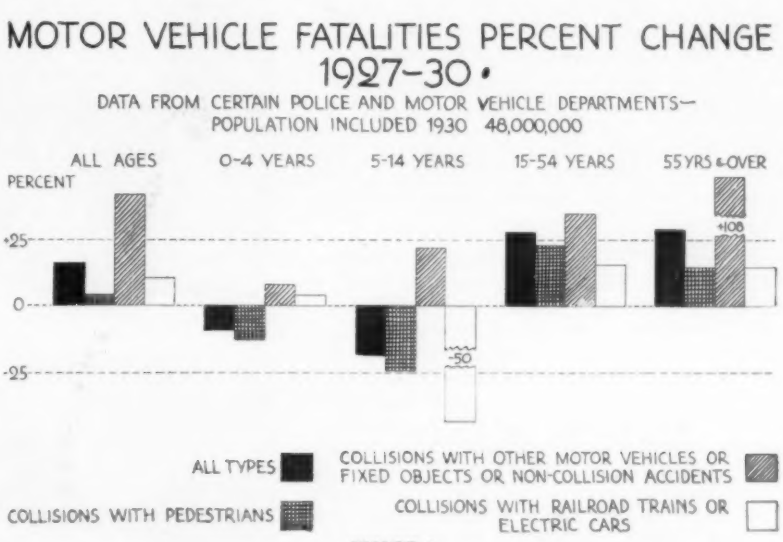


FIGURE 3

In attempting to draw a lesson from these figures, it is important to note that private passenger cars involved in accidents increased 37 per cent, although the number registered in this period has gone up only 15 per cent. Trucks, on the other hand, in spite of the 21 per cent increase in registration, were involved in accidents less frequently in 1930 than in 1927. The inference from the three charts would seem to be that children have been more influenced than adults by public safety educational efforts, and, similarly, that such efforts have had a greater effect on the drivers of trucks and public service vehicles than on private automobilists.

Contents of Previous Issues

of THE AMERICAN CITY may be found by consulting The Readers' Guide to Periodical Literature on file in all public libraries.

YOU TAKE NO CHANCES
WHEN YOU CHOOSE FROM THE
WORLD'S
GREATEST LINE
OF GRASS CUTTING EQUIPMENT

The new Ideal Power Mowers—four sizes—are built with the same careful attention to detail, and the same strict quality standard that has helped to make them part of the world's greatest line of grass cutting equipment. New motor gives greater, smoother power — greater flexibility and handling ease. New lubrication. New cooling. New aluminum construction eliminates dead weight. Automobile-type differential gives easy turning. Timken bearing crankshaft. Automobile-type valve mechanism. Wheel type models are made in two sizes—20, and 25-inch cut. Roller type models made in two sizes—22, and 30-inch cut.

The famous Ideal Bulldogs are without an equal on big, open cutting jobs. Their low-wheeled construction means smoother work and an absence of high repair costs.

Ideal Triplex Mowers for larger, thickly foliaged areas are an ultimate economy on most parks. The Triplex can mow 35 acres in one day. Foliage and trees don't bother it, or slow its work, for the Triplex swerves around them with ease and accuracy. For traveling from one job to another, rubber-tired traveling wheels can be provided, and the Triplex can ride down any street or highway. Send for new 1931 catalog.

Some of the prominent park departments using the Triplex: Park Dept., Washington, D. C.; Park Dept., Toronto, Canada; Park Dept., South Bend, Ind.; Bronx Park, New York City; Park Dept., Richmond, Va.

Wheel Type—20, 25-inch cut

Roller Type—22, 30-inch cut

The Bulldog

The Triplex

IDEAL POWER LAWN MOWER COMPANY
400 KALAMAZOO ST., LANSING, MICH.

FACTORY BRANCHES

413 W. Chicago Ave., Chicago, Ill. — 237 Lafayette St., New York City — 161 Vester St., Ferndale (Detroit) Mich. — 273 Boylston St., Brookline, Mass

DEALERS IN ALL PRINCIPAL CITIES

Canadian Distributor: Aikenhead Hdw. Ltd., 17 Temperance St., Toronto, Ont.

IDEAL ★ ★
GRASS CUTTING EQUIPMENT

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Unemployment Relief

Widespread distress for unemployment held to be a "calamity," authorizing a bond issue.

A Michigan statute authorizes home-rule cities to incur three-year loans for the relief of inhabitants "in case of fire, flood or other calamity." Interpreting this provision, the Michigan Supreme Court said in the case of *City of Muskegon Heights v. Danigelis*, 235 N. W. 83:

"We hold the term, as employed in the statute, is not limited to distress occasioned by physical forces, but extends to an overwhelming adversity, such as widespread inability to obtain employment and distress occasioned thereby. This construction rightly accords to the members of the Legislature humanitarian intent.

"This brings us to the question of whether an emergency existed justifying issuance of the bonds.

"The city council deeded 'that the exhaustion of funds for relief of city poor constituted an emergency.' The distress among inhabitants was acute and occasioned by an extraordinary event; want and misery, occasioned by employment, was widespread and demanded prompt alleviation. The fund for the relief of the poor was exhausted, and the winter season at hand. The City Council was confronted by a most serious condition existing among inhabitants, as disclosed by the proofs, and there existed an emergency justifying resort to the extraordinary method for relief of misery authorized by the statute and the city charter."

Sidewalk Rights

Abutting property owners held not entitled to restrain narrowing of sidewalk, nor interference with sub-street use.

In the case of *Swaim v. City of Indianapolis*, 171 N. E. 871, decided by the Indiana Supreme Court, plaintiffs, owners of property on Massachusetts Avenue, Indianapolis, sued to enjoin narrowing an abutting sidewalk from 18½ feet to 10½ feet, in widening the roadway from 50 feet to 66 feet—8 feet on each side. Question was also raised concerning the rights of plaintiffs to continue use of vault spaces under the sidewalks. In deciding the controversy, the Supreme Court said:

"The problem of determining what use it shall be necessary to make of land dedicated for a street, including the problem of determining what proportion of the surface of the street shall be devoted to a roadway and what proportion to sidewalks, is necessarily one of fact, which must be determined from time to time by the proper authorities of the city. . . . Such discretion, unless there is the clearest abuse thereof, is not subject to control by the courts. . . . .

"An abutting owner, regardless of whether he is the owner of the fee of the street or highway, has a special easement or access therein for purposes of ingress and egress, which easement is subordinate to the public convenience, of which the public authorities having control of the public streets are the judges. . . . The facts proven do not show that the change in the width of the sidewalk will materially affect ingress and egress to and from appellants' property. . . .

"Where the fee of the street is in the municipality, the abutting owner can make use of the space thereunder for basements or vaults only upon express permission of the municipality. . . . Where the fee of the street is in the abutting owner, some states hold that such owner may use such space without permission from the municipality, so long as he does not interfere with the dominant easement of the public [citing decisions of the courts of Florida and Massachusetts]; while elsewhere it is held that even then there must be express permission from the municipality for such use [citing a New York decision]. . . . .

"The permission of the city, where necessary for the construction and use of such a basement, need not be express, but may be implied, and the lapse of many years' time raises the presumption that the city acquiesces in such use. . . .

"Having lawfully entered upon the use of the basement under the sidewalk and street, the appellants are entitled to continue their use so long as they do not thereby obstruct or endanger such use of the sidewalk and street as is now made thereof by the public, or such use as is needed by the public. . . .

"Abutters who do not own the fee to the center of the street cannot by long-continued enjoyment of the use of a basement or vault attain prescriptive rights therein, . . . and their license or permissive use may be revoked by the city at any time when the space is required for proper public use. . . . Abutters who own the fee to the center of the street own it subject to the use of the street for all public purposes and subject to the power of the municipality to control and regulate the streets. . . . Such abutters are bound to withdraw from occupation of the streets above or below the surface whenever the public needs the occupied space for travel."

Important Legal Decisions

involving municipalities, as reported in this department during 1930, are indexed and classified in the 1931 Municipal Index, just published. This reference list, commencing on page 147 of the 1931 Index, supplements similar lists appearing in the 1930 and 1929 volumes, while the 1928 Index contained a list covering 1924 to 1927, inclusive.

Variance in Bid

Slight variation from specifications for fire equipment held not fatal to bid.

The right of a city to accept a bid for fire apparatus was not defeated because the bid was for engines whose horsepower development fell short of the requirements of the bidding specifications by 0.25 of 1 horsepower, held the New York Supreme Court for Onondaga County in the Syracuse case of *Hopkins v. Hanna*, 239 N. Y. Supp. 489. The Court applied a rule laid down by the New York Court of Appeals that if the requirement of a "statute is substantially complied with, and its actual purpose secured, . . . an unessential variance in the proposed bid does not render the contract invalid."

Liability on Contract

City held liable for breach of agreement incidental to improving navigation facilities.

The case of *Losei Realty Corp. v. City of New York*, 171 N. E. 899, decided by the New York Court of Appeals, was in action for damages for defendant city's breach of contract to fill in plaintiff's waterfront property on Jamaica Bay with dredged material. The contract was made as an incident to gaining access to a pier owned by the city. In upholding the plaintiff's claim, the Court remarked:

"The purpose of the contract was to improve the city waterfront and to give plaintiff a usable property with a proper depth of water. This was a legitimate exercise of the power of the city over the improvement of navigation facilities. . . . The plaintiff is entitled to recover as damages the loss reasonably resulting from the delay."

Notice of Council Meeting

Councilman unable to attend special meeting need not be notified thereof.

Where a member of a council of a Nebraska city was absent from the state and physically unable to attend a called meeting of the council, the meeting was legally held without his being notified. In reaching this conclusion in the case of *Burrows v. Keebaugh*, 231 N. W. 751, the Nebraska Supreme Court said that to have given notice to the absent alderman "would have been an idle gesture."

Alley Railroad Siding

Permit to construct railroad siding in alley upheld.

As against an abutting property owner not thereby deprived of the use of an alley, the city of Detroit had a right to authorize construction of a railroad siding in the alley to serve another property owner. (Michigan Supreme Court, in the case of *Harding Coal Co. v. Pollack*, 232 N. W. 231.)

He Can Help You SAVE LIVES

THREE KILLED, THREE INJURED IN AUTO CRASH
1926 Accident Fatal to 3 Others of the Same Family.
April 7 —
(Special)—The colony of Irish de-
scendants who attend little St. Pat-
rick's church on a hill east of Adell
Tuesday lost three more of its mem-
bers in an automobile collision at
County Trunk A and Highway 57.
On May 13, 1926, three other per-
sons, all related to Tuesday's vic-
tims, were killed in a similar crash
EIGHT HURT IN ACCIDENTS
Eight persons, five of them chil
dren, Sunday were injured in traf
fic accidents.
Jack Gnacinski, eight, and h
sister, Mary Ann, three, were c
and bruised when an automob
driven by their father, John, 19
S. Thirty-third st., collided with
Lincoln av., bus at Grant and
Thirty-first sts.
Robert Peterson, eight, 2618 Fo
du Lac av., broke his left leg w
he ran into the side of an
bile at Fond du Lac av. and
ty-seventh st., while Harvey Cla
12, of 1724 N. Thirteenth st.,
hurt when an automobile ran over
right foot near his home.
13, and

YOUR constant effort to make streets and highways safer for your citizens will be greatly helped by a Motorcycle Squad.

Experience of cities having the best motor-fatality records has proved that the Motorcycle Policeman is the surest safeguard against traffic accidents.

One glimpse of his uniform instantly checks reckless driving. No motorist speeds if there is a Motorcycle officer nearby. Traffic moves more smoothly when he is on the job.

No Police Force is complete without a Motorcycle Squad—there is no substitute. Most squads ride Harley-Davidsons—there are more of these motorcycles in police service than all other makes combined. Let your local Dealer show you the 1931 models.

Write for free Booklet—full of interesting facts about Motorcycle Police and their use. A postal will bring your copy.

HARLEY-DAVIDSON MOTOR COMPANY
Dept. M Milwaukee, Wis.

HARLEY-DAVIDSON
The Police Motorcycle

Park Accidents

City held not liable for drowning of boy in park pond on thin ice breaking under him, because precautions not taken against such accidents.

An eleven-year-old boy was drowned in a pond in a St. Louis park while attempting to rescue a younger brother who had ventured out upon thin ice on a warm February day. Holding that the city was not liable on the ground of having carelessly omitted to place a fence or barrier around the pond, the Missouri Supreme Court said (*Volz v. City of St. Louis*, 32 S. W. 2d, 72):

"If it is negligence to fail to place barriers around ponds or water into which a youth may fall and drown, why is it not negligence to fail to erect barriers to prevent children from climbing trees from which they may fall to their injury or death, or to fail to place barriers around a thorny bush or shrub against which youth may prick their flesh and thus possibly develop an infection causing death? Such precautions would not only be impracticable, but would mar the symmetry of the landscape of the park and impair recreation. The negligible danger arising from youth drowning in ponds without barriers in public parks must be subordinated to the pleasure and recreation of the people as a whole. We do not think that a city is necessarily negligent because it fails to place a fence or barrier around a pond, either natural or artificial, in a public park, although situations may arise that develop negligence."

Liability—Swimming Pool

Operation of swimming pool and water works for profit held not to be governmental functions; hence cities were liable for negligence.

The Court of Common Pleas for Allegheny Count, Pa., decided in the case of *Barto v. City of McKeesport*, 21 Pa. Munic. Law Rep. 50, that the city was liable for the drowning of a boy who was sucked through a valve in a large pipe when a guard at a municipal swimming pool negligently opened the valve without warning to the boy, who was swimming in the pool.

Tax Payments

Loss through failure of bank on which check for taxes was drawn held to fall on taxpayer, although treasurer delayed presenting check.

Idaho taxpayers issued checks to pay their taxes. The County Treasurer gave receipts for the taxes, but delayed presenting the checks for payment. The bank on which the checks were drawn failed. There were ample funds to have met the checks had they been presented promptly. The taxpayers contended that this amounted to payment of their taxes, as against the county, and denied their liability to repay the amount. But, in the case of *Gray v. Boundary County*, 290 Pac. 399, the Idaho Supreme Court said:

"This is no payment. 'All taxes must be paid in lawful money of the United States.' C. S. sec. 3233. This is a contest between taxpayers individually liable in the first instance and the county of Boundary. No rights of innocent third parties are involved. It was the duty of appellants to pay their taxes by delivering to the tax collector 'lawful money of the United States'; and this obligation could not be discharged by delivering to the officer written orders upon their debtor, the First State Bank. leaving to the officer the further business of reducing the orders to cash.

"For the failure of the officer to present the checks promptly, estoppel is urged. While it is true that the delay in presentation inured to the damage of appellants, such dereliction furnishes no element of estoppel against the county. It owed appellants no duty, whatever, other than to receipt for actual money received and make the proper entries; and it cannot be estopped by the failure of its officer to do what was by law forbidden and what it could not reasonably contemplate the officer would undertake."

Withdrawal of Remonstrance

Remonstrance against paving could be withdrawn before being acted upon.

The right of remonstrants against a street paving project to withdraw their objections was recognized by the Nebraska Supreme Court in the case of *Burrows v. Keebaugh*, 231 N. W. 751. The Court said:

"It is well settled that an objector may lawfuliy withdraw his name from a remonstrance at any time before the time for filing has expired, and many of the cases hold that they may withdraw their name at any time before the remonstrance has been acted upon by the council or other tribunal."

Railway Crossing

City held entitled to require street railroad to substitute grade crossing over railroad tracks for viaduct.

In the case of *New Orleans Public Service v. City of New Orleans*, 50 Sup. Ct. 449, the United States Supreme Court upheld an ordinance of the city of New Orleans requiring a street-railway company to demolish a viaduct over steam-railroad tracks and to construct a grade crossing in lieu of the viaduct. The Court said, in part:

"The value of the viaduct to be removed, the large expenditure involved for construction of the crossings in its place, and the dangers incident to their use constitute the sole basis of fact on which the ordinance is assailed. It is elementary that enforcement of uncompensated obedience to a regulation passed in the legitimate exertion of the police power is not a taking of property without due process of law. . . . . The sacrifice of the old structure and the cost of the new crossings involve a large amount of money. But the evidence fails to show that, having regard to the circumstances, it is so large that the regulation must be held to pass the limits of reasonable judgment and amount to an infringement of the rights of ownership. . . . While the elimination of grade crossings is desirable in the interest of safety, there are other means that reasonably may be employed to safeguard against collisions at intersections of public streets and railroad tracks. Presumably the city will make and enforce appropriate regulations at this crossing."

Home Rule Powers

Constitutional home rule charter did not inhibit a statute empowering the city to establish a university.

A taxpayer failed in a suit to enjoin the city of Omaha from establishing a municipal university, as authorized by Nebraska Laws 1929, chapter 200. His unsuccessful contention was that the Legislature could not authorize the university, because the city was operating under a constitutional home-rule charter.

The Nebraska Supreme Court said in this case (*Carlberg v. Metcalf*, 234 N. W. 87) that "in such cities, state legislation is not excluded upon such subjects as pertain to state affairs as distinguished from strictly municipal affairs. . . .

"The establishment and maintenance of a university in the city of Omaha relates to the matter of education. Education has always been a matter of state concern in Nebraska as distinguished from a matter of strictly municipal concern. . . .

"This university was not forced upon the city of Omaha. It was established as provided by a general law of the state. A petition of 10 per cent of the registered voters caused the Council to submit the matter to a vote, and a majority of the voters at said election voting on the question voted to establish and maintain such university."

Patented Materials

Call for paving bids on different materials, including one patented, upheld.

Sustaining an award of a paving contract, in the case of *Hoffman v. City of Muscatine*, 232 N. W. 430, the Iowa Supreme Court decided that where defendant city called for paving bids on four materials of like kind, the fact that one was under patent afforded the patentee no necessary advantage. The Court remarked:

"Surely where the city council puts four materials of like kind upon equal ground for the purpose of competition, the fact that one of such specified materials is under patent affords no necessary advantage to the patentee, or disadvantage to the other competitors."

Liability of Township Treasurer

Township treasurer held liable for leaving funds in a bank he knew to be in precarious condition.

A township treasurer who, through also being managing officer of a bank, knew that the bank was in precarious condition and yet permitted the township's funds to remain deposited there, became liable for resulting loss. (South Dakota Supreme Court. *Murdo Township v. Townsend*, 229 N. W. 935.)

It Becomes Glaringly Apparent

In these times when lighting costs are analyzed as never before — when civic beauty is scanned with a hypercritical eye — when improved service at lower rates is constantly demanded of the public utilities and when every penny saved in the cost of operating street railway properties adds approximately twenty per cent to the net . . . it becomes glaringly apparent **that there is no lighting standard as economic as ELRECO All-Purpose Poles.**

Lighting standards purchased to render real service should not be a burdensome capital investment. They should decrease the cost of installation and decrease the cost of maintenance. They should decrease operating costs and increase efficiency . . . the functions for which ELRECO designed and pioneered combination railway and lighting poles.

In flush times municipalities, public utilities and street railways could purchase any equipment they wanted to . . . to make the street prettier . . . to satisfy the vanity of some commission member . . . to have something novel for visitors to look at . . . but if poles are wanted for proper light distribution, economy of installation and maintenance, as well as several services from one pole, you must use Combination Railway and Lighting Poles, designed and pioneered by ELRECO.

One of our engineers will be glad to answer any questions or discuss ELRECO All-Purpose Poles with you in detail. Write for the facts . . . today.

ELRECO

The Electric Railway Equipment Company

2901 Cormany Avenue » » » » Cincinnati, Ohio

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

New Zoning Ordinance and Statute

FORT LEE, N. J.—February 18, 1931.

VERMONT.—1931, Senate Bill 25.

NOTE BY EDITOR.—Vermont is the forty-eighth state to pass zoning legislation, which is now to be found on the statute books of every state in the Union and of the District of Columbia as well.

Traffic Regulations

ILLINOIS. — *Ferguson Coal Co. v. Thompson, Mayor of City of Chicago*, 174 N.E. 896.—An ordinance restricting the weight of vehicles on certain streets is valid.

Platting—Dedication—Record

KENTUCKY.—*City of Middlesboro v. Kentucky Utilities Co.*, 35 S.W. (2d) 877.—The sale of lots by reference to a plat showing lots abutting on streets constituted dedication of streets though plat was not recorded.

Nash v. Pendleton, ib. p. 1002, in accord.

Platting—Access—Violation of Statute

NEW JERSEY.—*Merino v. George F. Fish, Inc.*, 153 Atl. 301.—Where the owner sells lots, referring in the conveyance to a map showing streets giving access to the lots, the fact that the vendor in laying out the street violated a statute does not affect the rights of the purchasers to access to the lots as shown on map.

Nuisance—Stone Quarry

MISSOURI.—*Davison v. Lill*, 35 S.W. (2d) 942.—An ordinance of the city of Maplewood prohibited the opening of a stone quarry, and a number of other industries, without permission of the City Council obtained by ordinance. *Held*, that as to the quarry the ordinance was void. The operation of a stone quarry in a municipality is not a nuisance per se, but may be one by reason of the method in which it is conducted. The ordinance in question, however, does not regulate the method of running quarries.

The ordinance is also void in failing to lay down a rule to guide the Council in exercising its discretion in this matter.

Numerous cases cited in accord.

Nuisance—Residential Districts—Undertaking Establishments

WASHINGTON.—*Haan v. Heath*, reported in *U. S. Daily*, March 26, 1931.—The construction and maintenance of an undertaking establishment in an exclusively residential district, in which there were no stores or other places of business, entitled the owner of a residence on an adjoining lot to $500 damages, where there was evidence of depreciation in the value of the property because of its proximity to the undertaking establishment, of noxious odors therefrom and of the tendency of undertaking establishments in residential districts to depress the minds of normal persons, since the undertaking establishment under such evidence constituted a nuisance for which the adjoining owner was entitled to damages, although not a nuisance per se and although the establishment was operated according to modern methods.

Nuisance—Garage and Oil Station in Residential Section

WISCONSIN.—*Ballstadt v Pagel*, 232 N.W. 862.—In commenting upon this case an editorial in the *New York Law Journal* summarizes in a helpful manner the law with relation to garages in residential sections, as nuisances. After stating that garages may be regulated by zoning, the editorial goes on to say:

"Where there are no zoning resolutions or zoning ordinances, which is still true in many smaller cities and towns, the question is frequently presented whether the erection of a garage and oil station in a purely residential section may be deemed a 'nuisance.'"

"This subject was recently presented to the Supreme Court of Wisconsin in the case of *Ballstadt v. Pagel* (232 Northwestern Rep. 862, Advance Sheets of December 10, 1930), in which an action in equity was begun by plaintiff, the owner of a residence in a fine and strictly residential district in the city of Merrill, Wis., for the purpose of restraining and prohibiting defendant from erecting a garage and oil station on a lot adjacent to plaintiff's residence on the ground that the erection and maintenance of such an establishment would constitute a nuisance. Neither the property of plaintiff nor that of defendant was subject to any restriction upon its use, either under the covenant or condition of any deed or similar instrument. The city of Merrill had no zoning ordinance. There had been no growth or extension of business districts toward the locality of the properties in question. No conditions existed which would in any way detract from or lessen the residential character of the neighborhood. The garage to be erected by defendant was to be kept open for public service, for storage, supply station, battery service, tire repairing and the dispensing and sale of gasoline and oil, both day and night, including Sundays, every day in the year.

"In determining whether such an establishment constitutes a nuisance, the test of public, as distinguished from mere private, nuisance must be carefully borne in mind (see editorial *New York Law Journal*, October 31, 1930, vol. 84, No. 26, p. 566). Blackstone defined public nuisances as those 'which affect the public and are an annoyance to all the King's subjects,' whereas private nuisances are 'anything done to the hurt or annoyance of the lands, tenements or hereditaments of another' (see *People v. Transit Development Co.*, 131 App. Div. 174, 178, 115 N. Y. Supp., 297, 301; *People v. Cooper*, 200 App. Div., 413, 193 N. Y. Supp., 16; *People v. Rubenfeld*, 254 N. Y., 245, per Cardozo, Ch.J.). In determining whether there is a nuisance, the trier of the facts must take into account all the circumstances, including such as public utility, locality, immediate surroundings, danger to the health, and the like (*McCarty v. Nat. Carbonic Gas Co.*, 189 N. Y., 40, 46-7). Organs of smell and hearing are entitled to protection against sounds and odors 'too pungent to be borne' (*People v. Rubenfeld*, supra; cf. *Bohan v. Port Jervis Gas Light Co.*, 122 N. Y., 18; see also, editorial *New York Law Journal*, October 4, 1930, vol. 84, No. 4, p. 68).

"In the Wisconsin case above discussed the Court came to the conclusion that after giving all the weight to social considerations, using that term in its broadest sense, the garage to be erected would constitute a private 'nuisance,' under the circumstances of the particular case, but indicated that such conclusion would not require the Court to hold that every garage in every case in a residential section would necessarily constitute a nuisance without regard to its location or manner of operation.

"The opinion of the learned unanimous Wisconsin Court, written by Rosenberry, C. J., follows:

" 'The first contention made here on behalf of the defendant is that the district in question is not a residential district. The facts with respect to this are so fully set out in the findings of the Court that it is unnecessary to repeat them here. From the photographs, maps, and evidence offered upon the trial, we conclude that the findings of the trial Court are fully sustained both as to the character of the nuisance sought to be enjoined as well as the finding relating to the character of the district in which the property is situated.

" 'We come therefore to a consideration of the only serious question in the case, and that is whether or not the findings sustain the judgment. We had occasion in *Cunningham v. Miller* (178 Wis., 22, 189 N. W., 531, 23 A. L. R. 739) to examine this question at considerable length and we there reached the conclusion that a funeral parlor maintained under the conditions there stated in a residential section constitutes a nuisance and its operation as such might be enjoined.

" 'This Court has held that the erection and maintenance of a garage does not constitute a nuisance per se (*Wasilewski v. Biedrzycki*, 180 Wis., 633, 192 N. W., 989).

Are Your Beaches And Pools Up To The Standard of 1931 ?

Salina, Kansas, Pool. Hill-Standard Equipped

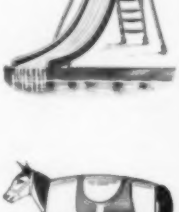
THE standard for 1931 is Hill-Standard. This is not said in a spirit of boasting. Investigation of the equipment used in the national and international diving events thus far in 1931 affords further proof. Today the popularity of the public beach or pool requires the latest and best in equipment. You make sure of this when you specify Hill-Standard—the acknowledged leader in quality.

Let us help you with your problem of new items or replacement.

Send for Catalog No. 7 a Real Guide

Beautifully illustrated in colors showing International Regulation Spring Boards (high and low), Life Guard Chairs, Water Slides, Diving Towers, Pontoon Units, Beach Gyms, Beach Swings, Surf Boards, Aquaplanes—over 100 items.

If you are interested in Parks, Playgrounds or Recreation Centers we shall also be glad to send you our Catalog No. 11 of Playground Equipment—the quality line—backed by 31 years of leading manufacture. "When you buy with confidence you have thought of Hill-Standard."



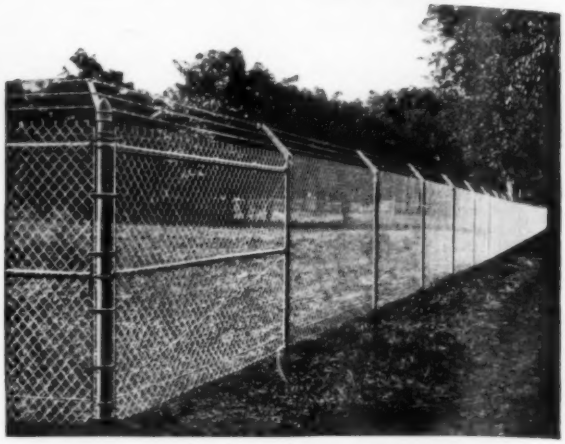
ADDRESS DIVISION "A"

HILL-STANDARD CO.

ANDERSON *Established 1900* INDIANA, U. S. A.

Largest Manufacturers of Water Sports, Playground and Floodlighting Equipment

SOUND ECONOMY *Demands* GOOD *Fence*



No Other Fence Will Cost So Little Per Year of Service

. . . CONTINENTAL Chain-Link is the modern fence—the choice of those who compare values. Made of "copper-bearing" steel, heavily galvanized with pure zinc by the hot dip process after weaving, it is protected from rust INSIDE and OUTSIDE. Strong, evenly woven fabric, sturdy fittings, substantial posts, erected under the supervision of experienced fence engineers. The ideal enclosure for Public Buildings and Grounds, School Yards, Athletic Fields, Parks, Playgrounds, Recreation Centers, Hospitals, Institutions, Utility Plants, and all types of public property. Let the Continental representative advise with you, without obligation. Write us today.

Continental Steel Corporation

KOKOMO, INDIANA

Distributors in all Principal Cities

Manufacturers of: Chain-Link, Farm, Poultry and Lawn Fence and Gates; Billets, Rods, Wire, Nails and Barbed Wire; Black, Galvanized and Roofing Sheets.

(186)

CONTINENTAL

TRADE MARK

"'Whether or not it constitutes a nuisance depends upon the place where it is located, the business to be carried on, and the necessary incidents thereto. A careful perusal of the cases decided in other jurisdictions leads to the conclusion that each case must stand or fall largely upon its own facts. The facts found by the trial court in this case bring it well within the case of *Cunningham v. Miller* (supra) and unless the judgment is to be sustained it is apparent that that case must be overruled. Differences of opinion are bound to arise in questions of this kind because of the fact that they are viewed from different standpoints. What is regarded in law as constituting a nuisance in modern times would no doubt have been tolerated without question in former times. It is no doubt true that zoning laws would have been held unconstitutional under the conditions that existed prior to the Civil War; not that the law is different, but the conditions to which it is applied have changed. Some weight must be given to social considerations, using that term in its broadest sense.

"'We are also reminded of the fact that in this case no nuisance has been created, but it does appear clearly that a nuisance will result from the contemplated act (*Wasilewski v. Biedrzycki*, supra). The cases upon this subject are collected in a note to *George v. Goodovich* (288 Pa., 48, 135 A., 719, to be found in 50 A. L. R., 107).

"'The facts in this case bring it well within the rule laid down by the great weight of authority in this country that a garage and oil station conducted as the Court found this one would be, the findings being based upon the testimony of defendant himself, when erected and carried on in a purely residential section, constitutes a nuisance. This conclusion will not require us to hold that every garage in every case will constitute a nuisance without regard to its location or manner of operation as is contended by defendant.'"

Pending Zoning Ordinances—Refusal of Mandamus

NEW JERSEY.—*Horowitz v. Rath, Inspector of Buildings of City of Bayonne*, 153 Atl. 250.—Mandamus for permit to erect apartment houses in a zone which in a pending ordinance was made a single-family district was sought on the ground that more than a reasonable time had elapsed for its adoption since the constitutional amendment authorizing zoning. *Held*, that an ordinance which, after changes, was referred to the City Attorney, even though reported unfavorably, was sufficiently near adopted to justify refusal of mandamus.

NEW JERSEY.—*Linwood Co. v. Gardner, Building Inspector of town of Bloomfield*, 153 Atl. 99.—Application for mandamus for permit to erect two four-family dwellings. Permit was applied for May 21, 1930, and denied. This application was made October 4, 1930.

On October 6, 1928, the town appointed a zoning commission, which made no report until October 4, 1930. The report was adopted and the town attorney was directed to prepare a zoning ordinance in accordance therewith, which would zone relator's lands as a one-family house district.

Held, that the Court in its discretion should deny the writ. The Court, without excusing the inactivity of the town, takes judicial notice of the difficulties confronting municipalities in the preparation of zoning ordinances. This denial, however, is without prejudice to a future application therefor, or for a writ to require the town authorities to proceed to adopt a zoning ordinance.

Board of Appeals — Variance — Constitutional Amendment

NEW JERSEY.—*Jannarone v. Board of Adjustment of Town of Nutley*, 153 Atl. 256.— The constitutional amendment respecting zoning abrogated existing rights conflicting therewith; hence refusal of Board of Adjustment to permit a nonconforming use (on application for a variance) is not unconstitutional. Discretion of Board of Appeals upheld.

Board of Appeals—Title of Zoning Statute

NEW JERSEY.—*Werblin v. Wighton*, 153 Atl. 103.—Board of Adjustment will be sustained in their discretion in refusal to grant a variance when acting reasonably.

P. L. 1928, p. 698, Sec. 7, provides that existing zoning ordinances, passed before the constitutional amendment validating zoning, shall remain in force. *Held*, that the act was not invalid because its object was not expressed in its title, which was "An act to enable municipalities to adopt zoning ordinances," etc.

Eminent Domain—Parks

TENNESSEE.—*State v. Oliver*, 35 S.W. (2d) 396.—The state may directly exercise the power of eminent domain for the purpose of acquiring land to be transferred to the United States to be used as a national park.

VIRGINIA.—*Rudicille v. State Commission on Conservation and Development*, 156 S.E. 829, in accord with *State v. Oliver*.—The Federal Government may directly exercise the power of condemnation whenever necessary or appropriate in execution of any powers it has.

Streets—Obstructions

TEXAS.—*J. M. Radford Grocery Co. v. City of Abilene*, 34 S.W. (20) 830.—A wholesale grocery in an industrial section is not authorized to maintain a loading platform over a sidewalk notwithstanding that it was maintained with city's permission for 23 years.

NOTE BY EDITOR.—This is a decision of the higher court sustaining a decision below to the same effect. The decision of the lower court was reported in this department, page 189, January, 1930.

Purposes and Legal Sanctions of Zoning

In the March number of the American Bar Association *Journal*, Edward D. Lundels has published a suggestive analysis of recent zoning in this country. He feels that the protection of property values and the insurance of orderliness are often in fact and should more often be recognized as being the basis of zoning instead of the vaguer standards usually mentioned in the opinions of judges deciding zoning cases. His analysis from this point of view will be of interest to students of zoning in this country.

The Municipal Bond Market

By SANDERS SHANKS, JR.
Editor, *The Bond Buyer*

WITH a decidedly favorable attitude on the part of investors toward state and municipal obligations, as compared with other types of bonds, prices have worked up to the high level of three years ago. The index of prices of bonds of twenty large cities was 3.90 per cent on April 1 as compared with 4.03 per cent on Ferbuary 1.

New York State was able to dispose of $34,975,000 bonds carrying 3¼ per cent and 3½ per cent coupons, at a net interest cost of 3.4645 per cent, the most favorable terms at which the state has borrowed funds in twenty years.

The outstanding characteristic of the present market is the decided preference of investors for the highest grade securities. While other classes of bonds have increased in price, the use of high-grade municipals has been most striking during the first three months of this year.

The following representative list of sales of state and municipal issues indicates the current level of municipal bond prices:

Amount	Municipality	Rate (%)	Maturity	Net Basis (%)
$34,975,000	New York State	3¼ & 3½	15-yr. (avg.)	3.4645
260,000	Allen Co., Ind.	4½	10 5/6-yr. (avg.)	3.78
250,000	Brattleboro, Vt.	4	15¼-yr. (avg.)	3.99
183,000	Green Lake Co., Wis.	4½ & 5	10½-yr. (avg.)	4.00
1,478,000	Cuyahoga Co., Ohio	4¼	5-yr. (avg.)	4.17
1,956,000	Paterson, N. J.	4¼	14⅝-yr. (avg.)	4.22
88,169	East Grand Rapids, Mich.	4½	7 2/3-yr. (avg.)	4.31
350,000	Sweetwater Co., Wyo., Sch. Dist. No. 4	4½	11 5/6-yr. (avg.)	4.40
9,000	Perrysburg, Ohio, Ssch. Dist.	4½	1-9-yr. (ser.)	4.43
400,000	Eugene, Ore.	4½	17 5/6-yr. (avg.)	4.46
125,000	Raleigh Tp., N. C.	4¾	3 mos.	4.69
42,000	Gadsden, Ala.	5	5 2/3-yr. (avg.)	5.57
200,000	Tampa, Fla.	5½	14-yr. (avg.)	6.03

In inset—close-up cross-section of meshed gears, showing case hardening.

OLD *in working days*

YOUNG *in mechanical condition*

Surprisingly fit after many months of work like this. Tough alloys are used unsparingly. Bearings are dirt protected. Carburized (case-hardened) gears turn smoothly in oil, giving you more of trouble-free working days—extra return on your investment.

A free trial *on your job* ***Ask your Dealer***

Monarch "75," "50" and "35" track-type tractors. Model "U" wheel and track-type tractors and power units

ALLIS • CHALMERS • TRACTORS

SPRINGFIELD, ILLINOIS . . . MILWAUKEE, WISCONSIN

When you write for that catalog, kindly mention THE AMERICAN CITY

MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated.

Police Problems

Chicago Police Problems.—By The Citizens' Police Committee. University of Chicago Press. 1931. 300 *pp.* $3.00 *from* THE AMERICAN CITY.

The Citizens' Police Committee of Chicago was formed early in 1929 at the suggestion of Police Commissioner William F. Russell, in a letter addressed to Frank L. Loesch, President of the Chicago Crime Commission; Dr. Walter Dill Scott, President of Northwestern University; Dr. Frederic C. Woodward, acting President of the University of Chicago; and Judge Andrew A. Bruce, President of the American Institute of Criminal Law and Criminology. These four, as a supervisory committee, appointed an operating committee of eight, headed by Dean John H. Wigmore and later by Professor Leonard D. White; the latter group established an advisory committee of 48 members. The operating committee, with the Commissioner's full approval, decided upon a comprehensive study of the Police Department, including all major phases of its work, and engaged Bruce Smith, police expert of the National Institute of Public Administration, New York, who organized a staff and proceeded with the survey, which received the cooperation of Commissioner Russell as long as he was in office (to June, 1930). The present volume covers this exceptionally thorough investigation, which is reported in a clear and logical manner, from a constructive viewpoint, without passion or prejudice, but nevertheless untrammeled and highly readable. The subject-matter includes structural organization, leadership, management of personnel and property, criminal investigation and identification, traffic regulation, crime prevention, crime records, and various problems relating to the force, such as districting, signal service, numerical strength, compensation and welfare. Their treatment includes much that will be of interest to persons in, or interested in, police work throughout the country. The concluding chapter on a future program is reproduced in this issue of THE AMERICAN CITY, pages 133-34.

Tax Reduction

"Can General Property Taxation Be Reduced?" is the title of Bulletin No. 10 of the Division of Municipal and Industrial Research, Massachusetts Institute of Technology, under date of April, 1931, which discusses supplementary sources of municipal revenue currently being made use of in cities under a variety of state laws and local conditions. 8 pp. 10c. (Apply to the Division, Cambridge, Mass.)

Community Surveys

"How Good Is our Town?"—This is the title of a large quarto volume of 124 pp. in which are reproduced the forms for citizens' surveys of Wisconsin cities (described on page 104). A third enlarged edition. Edited by Aubrey W. Williams, General Secretary, Wisconsin Conference of Social Work. (Apply to the Conference, Madison, Wis.)

Probation

The 1930 Year Book of the National Probation Association is now available. It contains an analysis of adult probation laws in the United States and Canada which is believed to be the first summary of these laws ever made. Delinquents, juvenile courts and crime prevention are among the subjects discussed by an imposing list of contributors, which includes Dr. William Healy, Dean Roscoe Pound, Professors Frederic M. Thrasher and Raymond Moley. 357 pp. $1.00, paperbound; $1.50 cloth and boards. (Apply to the Association, 370 Seventh Ave., New York.)

An Industrial Survey

The Department of Industrial Development, of the County Borough of Rotherham, sets forth in an exceptionally well-planned book of 100 pages, advantages offered to new industries in low-cost land and taxes, transportation facilities, and cheap power. (Apply to C. L. Des Forges, Town Clerk, Rotherham, Yorkshire, England.)

American Year Book

The American Year Book—Record of the Year 1930.—*Editor, Albert Bushnell Hart; Associate Editor, William S. Schuyler. American Year Book Corporation, New York.* 1931. 887 pp. $7.50.

This useful annual, recording events and progress concerning the United States, is again published under the sponsorship of *The New York Times* and its President, Adolph S. Ochs, and with the cooperation of a supervisory board representing 47 national associations. The arrangement of material, including 234 narrative articles by some 200 contributors, is similar to that of last year: Historical, American Government, Governmental Functions, Economics and Business, Social Conditions and Aims, Science—Principles and Application, and The Humanities. With approximately a third of the contents devoted to public affairs, there are the usual chapters dealing with subjects with which municipal officials and others interested in local government are particularly concerned: V, Municipal Government; VII, Public Finance and Taxation; VIII, Public Resources and Utilities; XIX, Engineering and Construction; XXVIII, Education, as well as portions of other chapters.

Stream Purification

Public Health Bulletin No. 198 is Part II of "A Study of the Pollution and Natural Purification of the Illinois River," by Special Expert W. C. Purdy, of the U. S. Public Health Service, and is devoted to "The Plankton and Related Organisms." 212 pp. Illustrated. 45c. (Apply to Government Printing Office, Washington, D. C.)

Hydraulic Properties of Pipes

"Hydraulic Service Characteristic of Small Metallic Pipes" is the title of a paper by G. M. Fair, M. C. Whipple, and C. Y. Hsiao, read at the meeting of the New England Water Works Association in September, 1930. It is based on a three-year study by the authors, who are Associate Professor of Sanitary Engineering, Assistant Professor of Sanitary Chemistry, and Research Fellow, respectively, at the Harvard Engineering School. 134 pp. (Apply to Copper and Brass Research Assn., 25 Broadway, New York.)

Fire School

The "Proceedings of the Third Annual Northwest Fire School," which met in Minneapolis in September, 1930, and which was sponsored by the General Extension Division, University of Minnesota, the League of Minnesota Municipalities, the State Firemen's Association, and the state Insurance Department, with the cooperation of the cities of Minneapolis and St. Paul, are reported in an illustrated booklet of 70 pages. (Apply to the Northwest Fire School, University Library, Minneapolis, Minn.)

Municipal Reporting

The National Committee on Municipal Reporting, representing the American Municipal Association, the Governmental Research Association, the International City Managers' Association, and the National Municipal League, has for two years "prosecuted a cooperative inquiry and study into public reporting as it is conducted by the American municipality." From this study has resulted "Public Reporting," a volume subtitled "With Special Reference to Annual, Departmental and Current Reports of Municipalities," which is issued as Publication No. 19 of the Municipal Administration Service, 261 Broadway, New York. Some of the high lights of the Committee's findings are presented by its Executive Secretary in "The Preparation of Public Reports," April issue of THE AMERICAN CITY, pp. 125-127; and "Telling Citizens How the Public Job Is Done," pp. 113-15 of this issue. The contents of the published volume are in three parts: "The Preparation of Public Reports"; "Suggested Outline for the Annual Report"; and "Specifications for Departmental and Functional Reports." 160 pp. 75c. (Apply to THE AMERICAN CITY.)

Traffic Engineering

The proceedings of the semi-annual meeting of the Institute of Traffic Engineers, held in New York in January, are available in 28-page multigraphed, bound form, and include progress reports of committees on Research; Professional Curriculum; The Evolution of the Art of Traffic Control and Regulations; and Terminology and Nomenclature. Addresses also given: "The Economics of Traffic and Transportation," by Major John P. Hallihan, Chief Engineer, Detroit Rapid Transit Commission; "Some Fundamental Economic Principles of Traffic Engineering," by John I. Knudson, Professor of Economics, Polytechnic Institute of Brooklyn; and "The Application of Mathematics to Traffic Engineering," by Ernest P. Goodrich, consulting engineer, President of the Institute, New York City. (Apply to the Institute, 175 Fifth Avenue, New York.)

Subdivision

Information about subdivision, with particular reference to Kern County, California, may be found in the "Guide for the Subdivision of Land," published by the Kern County Planning Commission in 1930, and in a paper on "Procedure Under the California Subdivision Map Act, with Particular Reference to County Planning," presented at the December meeting of the California County Planning Commissioners Association by Hugh R. Pomeroy, city and county planning advisor. The "Guide" contains an outline of procedure and time schedule; the subdivision ordinance of Kern County; the Map Act of the state of California; standard forms for certificates, etc.; checking forms; sample maps; and the rules of the Kern County Planning Commission. 30 quarto pp. Mr. Pomeroy's address of 18 annotated typewritten pages includes a history of the map-filing requirements of the state, and is supplemented by 9 pages of rules for reserved dedications. (Apply to Mr. Pomeroy, 559 S. Figueroa, Los Angeles, Calif.; or, for the "Guide" only, to the Kern County Planning Commission, 319 Haberfelde Bldg., Bakersfield, Calif.)

State Park Land

The "Program for State Ownership of Park and Forest Land in New Jersey" is presented in a 28-page booklet issued under date of March 2, 1931. This shows state reservations and other public reservations with recommendations for additional purchases; and a recommended program of seashore acquisition. (Apply to State Board of Conservation and Development, State House Annex, Trenton, N. J.)

Regional Planning

An "Interim Report on Decentralization" and an "Interim Report on Open Spaces," both by Dr. Raymond Unwin, F.R.I.B.A., technical adviser to the Regional Planning Committee of Greater London, are published in paper-bound form under date of January, 1931, and supplement the Committee's considerable number of previously published reports. 18 pp. and 12 pp. 6d. each, net. (Apply to Knapp, Drewett and Sons, Ltd., 30, Victoria St., Westminster, S.W.1, England.)

"Irons in the Fire"

This is the title of the new news bulletin of the Elmira Association of Commerce, Elmira, N. Y., which is as attractive in appearance as in title, and which is a demonstration of the fact that mimeographing may be used in a way to appear both interesting and readable. 2 pp.

Through Streets

Lewis W. McIntyre, Chief Engineer, is the author of a report on "Pittsburgh's Experience with Thru Streets," in which he is able to show that since 1928 that city's six traffic ways established by ordinance as "thru streets" have been responsible for a steady decrease in motor-vehicle accidents. The operations and results are discussed in detail. 4 pp. multigraphed. (Apply to Bureau of Traffic Planning, Dept. of Public Safety, City-County Bldg., Pittsburgh, Pa.)

IN POWER, RUGGEDNESS SPEED . . . PRICE

today's outstanding TRUCK VALUES!

ON hundreds of state, county and municipal jobs, General Motors Trucks are writing impressive performance records. One big reason is that each unit is exactly *suited to its job.* This is made possible by the unequalled completeness of this great truck line.

There is a modern 6-cylinder General Motors Truck accurately suited in power, speed and ruggedness for virtually any truck job that exists.

The line offers today's greatest VALUES. General Motors Truck advantages in engineering, manufacturing and purchasing were never more sharply evident.

Investigate these *General Motors Values!* That name tells you that every advance—*of proved merit*—in design and construction is found in these modern vehicles. *See them!*

GENERAL MOTORS TRUCK COMPANY, Pontiac, Mich. (*Subsidiary of* Yellow Truck & Coach Mfg. Co.) GENERAL MOTORS TRUCKS, YELLOW CABS AND COACHES. Factory Branches, Distributors, Dealers—in over 2200 principal cities and towns. (*Time payments financed through our own* Y. M. A. C. *plan at lowest available rates.*)

GENERAL MOTORS TRUCKS

GM — A PRODUCT OF GENERAL MOTORS

Water Works

Pittsburgh, Pa.—Its Water Works and Typhoid Fever Statistics.—By the late Erwin E. Lanpher, Managing Engineer of the Bureau of Water; and C. F. Drake, Superintendent, Filtration Division, Bureau of Water, Pittsburgh, Pa. 1930. *Revised reprint, February,* 1931.

A 45-page booklet containing treatises on the Pittsburgh water works written by the late Erwin E. Lanpher, and typhoid fever statistics in Pittsburgh since 1873, prepared by Mr. Drake. The City Council appropriated the necessary funds for printing this valuable publication, which was edited by Miss Violet M. French, Secretary to Mr. Lanpher. These treatises are used in the Pittsburgh city high schools in the civics and science classes, and universities throughout the country have requested them for municipal research work. Copies may be secured by municipal officials by writing to Miss Violet M. Finch, Bureau of Water, 416 City-County Building, Pittsburgh, Pa.

Public Safety

Safety Education.—By Idabelle Stevenson, Executive Secretary, Education Division, National Safety Council. A. S. Barnes and Co. 1931. 157 *pp. Illustrated.* $1.00 *from* THE AMERICAN CITY.

Miss Stevenson's contribution to the Barnes Extra Curricular Library series is both sound and immediately practical. It should find wide usefulness as a guide to teachers and group leaders concerned with promotion of safety programs in the schools and in the community. Following a general discussion of the national accident problem and how education may help solve it, there are chapters on methods of teaching safety, student safety organizations, safety patrols, accident reporting and inspection, publicity, the safety assembly program, special projects, and safety for school athletic programs. The information essential to safety education is interestingly discussed. The whole is illustrated with charts and diagrams.

Cancer Education

The New York City Cancer Committee is now entering its fifth year of public education. Its object is to reach those who, through ignorance or fear, fail to receive proper diagnosis and care during the early—and often curable—stages of the disease. A detailed account of its technique and results of its annual campaign is given by John C. A. Gerster, M.D., Chairman, and Susan M. Wood, Executive Secretary, of the New York Committee, which is a unit of the American Society for the Control of Cancer, in a 12-page reprint from *The American Journal of Cancer,* January, 1931. (Apply to the Committee, 34 E. 75th St., New York.)

Public Health

The American Public Health Association Year Book, 1930-1931, the first in the 60 years of the Association's existence, brings together all committee reports from the 1930 annual meeting at Fort Worth, and information concerning the organization and its activities. A complete list of members and affiliated members is appended. 320 pp. $3.00. (Apply to the Association, 370 Seventh Ave., New York.)

Public Health Law

"The Fundamentals of Public Health Law" is the title of a paper by James E. Bauman, Assistant Director of Health, Ohio State Department of Health, Member of the Columbus, Ohio, Bar, in the *Public Health Reports,* Vol. 46, No. 12, March 20, 1931, that will be of value to public officials and civic leaders concerned with the reasonable regulation of sanitary conditions in their communities. 10 pp. 5c. (Apply to Government Printing Office, Washington, D. C.)

Traffic

A "Bibliography on Street and Highway Traffic," published by the American Electric Railway Association (A.E.R.A. Bulletin No. 355) under date of April 1, 1931, is a revised edition of the bibliography issued a year ago as Bulletin 305. It contains a complete index of the Association's library on street traffic literature, including the most important traffic surveys, general publications and articles in periodicals. (Apply to the Association, 175 Fifth Ave., New York.)

School Architecture

School Buildings of Today and Tomorrow.—By W. K. Harrison, of Corbett, Harrison and MacMurray, Architects; and C. E. Dobbin, Deputy Superintendent of School Buildings, New York City. Compiled and edited by R. W. Sexton, Editor, "American Architecture of Today Series." Architectural Book Publishing Co., Inc., New York. 1931. 233 *pp.* $16.50 *from* THE AMERICAN CITY.

School architecture has not kept pace with changing curriculums and accelerated living. We still accept Gothic and Colonial buildings whose style and floor plans are unrelated to our present needs. School buildings should be planned, not only for today but for tomorrow, to be used not for just six hours a day but rather for sixteen. Radio and television must be reckoned with. Traffic; lighting; heating and ventilating; adaptable equipment—these are some of the questions demanding special consideration.

The purpose of this book is "to determine what are the needs and requirements of the school building of today and to discuss what may be the needs and requirements of the school building of tomorrow; then to illustrate how the spirit, peculiarities and character of our own times may be reflected in their design." A compact text and hundreds of stimulating photographs and sketches of buildings and rooms here and abroad offer constructive suggestions. Part I, by Mr. Harrison, discusses "The Design of the Modern School." Thirty pages are then devoted to views and plans of "A Group of Modern Schools in Foreign Countries." In the third section, "The Standardization of School Buildings," Mr. Dobbin describes the advantages and the possibilities of the standards worked out by the Architectural Bureau of the Board of Education of New York City.

A problem which looms large but which is not taken up in this volume is how to educate taxpayers to insist on as modern facilities in their educational buildings as they require in their offices and factories.

"Pittsburgh"

The Engineers' Society of Western Pennsylvania, in commemoration of its Fiftieth Anniversary, has published a substantial volume devoted to the region of Pittsburgh, its geography and history, and its industrial, civic, and governmental development and operations, 1880-1930. The sections on City and County Government, Parks and Public Recreation, and Health and Safety, will be of interest to readers of THE AMERICAN CITY, as will the record of waste disposal and reclamation. 420 pp. (For details apply to the Society, Pittsburgh, Pa.)

Fire Prevention

A new "Fire Prevention Guide for Chambers of Commerce," designed to assist local organizations participating in the Inter-Chamber Fire Waste Contest, has been published. 27 pp. (Apply to Chamber of Commerce of the United States, or the National Fire Waste Council, Washington, D. C.)

Golf Courses

An article on "Golf Course Design and Construction," by Wayne B. Stiles; and one on "Landscape Feature of Golf Courses and Surrounding Communities," by Arthur A. Shurcliff (16 pp. together) appear in the *Journal* of the Boston Society of Civil Engineers, February, 1931. The price is 50c; not 10c, as stated in April. (Apply to the *Journal,* Boston, Mass.)

Local Government

Report No. 1 of the Commission to Investigate County and Municipal Taxation and Expenditures, of the New Jersey Taxpayers Association, is a study of the Organization, Functions and Expenditures of Local Government in New Jersey. The material is presented in three divisions devoted to the three subjects, and is illustrated with maps, charts, and tables. Report No. 2 contains details of municipal and county debt. The study was directed by Harley L. Lutz, Professor of Public Finance, Princeton University, and made by members and consultants of Griffenhagen and Associates, Ltd. 276 pp. and 138 pp. See further descriptions on p. 149. (Apply to New Jersey Taxpayers Association, Trenton, N. J.)

Housing

One of the many subcommittees of the White House Conference on Child Health and Protection was asked last November to draw up optimum standards for dwellings in which there are children. Dr. James Ford, Harvard professor, and Executive Director of Better Homes in America, as chairman of the subcommittee, discusses the standards as provisionally arrived at in a 10-page article in the American Building Association News, now available in reprint form for 10 cents. (Apply to Dr. Ford, Better Homes in America, 1653 Pennsylvania Ave., Washington, D. C.)

Regulation of Bathing Places

A tabulation of "State Regulations of Public Baths, Swimming Pools, and Other Bathing Places," and a comparison of these with waterworks regulations, appears in *The Journal* of the American Association for Hygiene and Baths, March, 1931, and is followed by some discussion of new state regulatons. 7 pp. The April issue will contain references to all available laws and rules on the subject, and a digest of the empowering legislation, requirements affecting hygiene and penalties for violations. *The Journal* is $1 per year. (Apply to 917 E. 47th St., Chicago, Ill.)

"Washboards"

The Engineering Experiment Station of the State College of Washington undertook an active study of rhythmic corrugations in highways, in 1925, and now issues its third report of progress, as presented by Homer J. Dana, Washington State Highway Department cooperating. Certain definite conclusions have been established, and further studies are to be made as time and money permit. 28 pp. (Apply for Engineering Bulletin No. 36, Engineering Experiment Station, Pullman, Wash.)

Unemployment

"Is America's Alternative 'Starve or Steal'?" is the title of a 4-page circular issued by the National Unemployment League, Inc., which reviews the existing situation and the prospects of improvement. "Immediate work for at least a million men on Federal public works" is the only relief it sees. (Apply to the League, 420 Madison Ave., New York.)

Traffic Safety Education

"Selecting and Training of Vehicle Operators," by Dr. V. V. Anderson, and "Making the Vehicle Operator Safety Conscious," by G. A. Rogers, two papers from the Second Annual Greater New York Safety Conference, February, 1931; also "The Use of Accident Statistics," by Hawley S. Simpson, a paper from the Community Safety Conference, New York, March, 1931, are available in multigraphed form, 16 pp., 8 pp., and 12 pp. (Apply to National Safety Council, 21 E. 40th St., New York.)

The City Manager Plan

The National Municipal League has issued a completely revised edition of the service pamphlet, "The Story of the City Manager Plan." The progress of the movement to date is given, with a record of achievements in certain cities, a list of places where the manager plan is in effect, and a brief bibliography. 48 pp. 10c. (Apply to the League, 261 Broadway, New York.)

Other Reports Received

CHICAGO, ILL.—Five-year report, Department of Health, 1926-1930. 1,165 pp. clothbound.

CINCINNATI, OHIO.—Annual report, "Municipal Activities," 1930. 100 pp.

DES MOINES, IOWA.—Annual report, City Plan and Zone Commission to April 1, 1931. 50 pp. multigraphed.

SOUTH AFRICA.—Official Municipal Year Book, 1930-1931. 520 pp. Booksellers: J. C. Juta and Co., Capetown and Johannesburg, South Africa.

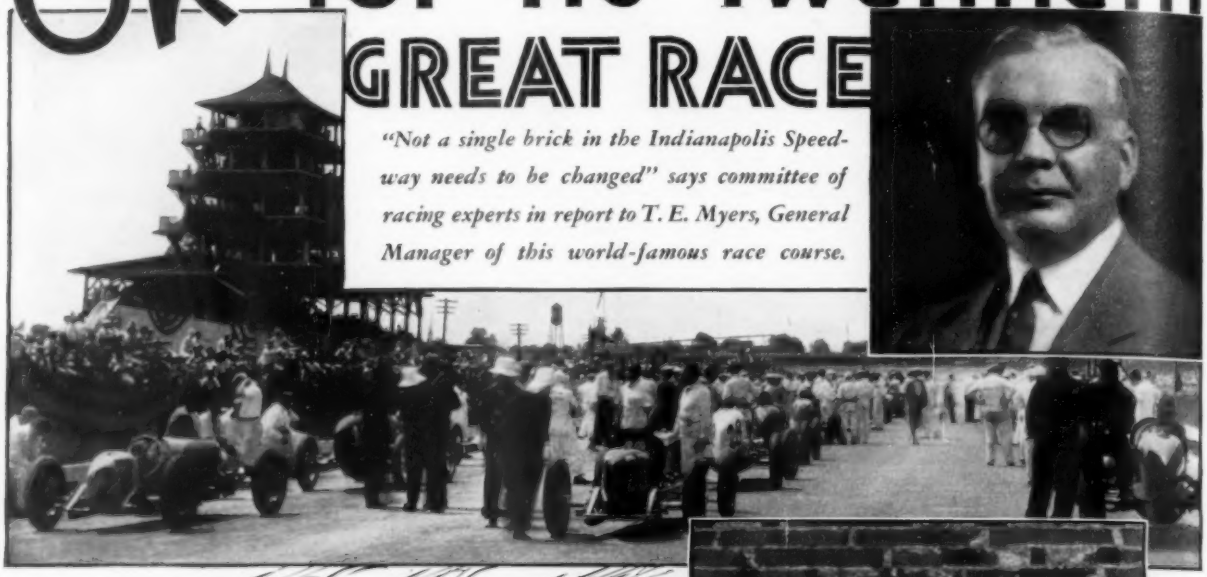
STAUNTON, VA.—Annual report to March 31, 1931. 52 pp.

TORONTO, ONT.—Annual report, Department of Street Cleaning, 1930. 36 pp.

WATERBURY, CONN.—Report of Charter Commission to the Governor and General Assembly, December 31, 1930. 991 pp.

Oh for its Twentieth GREAT RACE

"Not a single brick in the Indianapolis Speedway needs to be changed" says committee of racing experts in report to T. E. Myers, General Manager of this world-famous race course.



AGAIN on Memorial Day, the world's best racing drivers will push their accelerators to the floorboard and speed for 500 miles over this famous brick pavement at Indianapolis.

How motors have changed in twenty years! But the same brick pavement that carried Ray Harroun to victory in 1911 will carry another driver to fame and $100,000 in 1931.

There is a record for a pavement—taking the full speed of the fastest cars twenty years after it was constructed.

The reason for the excellent condition of this and other brick pavements that are in active use after twenty to forty years is that *brick resists weather* as well as traffic.

For information on Brick Pavements, write National Paving Brick Manufacturers Association, 1245 National Press Building, Washington, D. C.

Insert Above—Scene at the Speedway as the race begins.

Insert Above, Right—T. E. Myers, General Manager of Indianapolis Motor Speedway Corporation.

Insert Below—Close-up view of the brick surface at Speedway over which the fastest cars have competed for the past 20 years. An inspection by racing authorities caused them to pronounce the track in just as excellent condition today as when completed in 1911. This photo is not retouched.

VITRIFIED

BRICK PAVEMENTS

FACE THE FUTURE « » PAVE WITH BRICK

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance, other than local.)

MAY 5-6.—WILMINGTON, DEL.
Maryland-Delaware Water and Sewerage Association. Annual conference. Secretary, A. W. Blohm, 2411 North Charles Street, Baltimore, Md.

MAY 11-14.—TORONTO, ONT. (500)
National Fire Protection Association. Annual meeting. Managing Director, Franklin H. Wentworth, 60 Batterymarch Street, Boston, Mass.

MAY 12.—HARTFORD, CONN.
Connecticut Chamber of Commerce, Inc. Annual meeting. Executive Vice-President, H. E. Hasty, Executive Offices, 410 Asylum Street, Hartford, Conn.

MAY 13-15.—SAVANNAH, GA. (500)
Association of County Commissioners of Georgia. Annual convention. Secretary-Treasurer, Fred Houser, 246 Spring Street, N. W., Atlanta, Ga.

MAY 13-14.—HUNTINGTON, IND. (150)
Indiana Association of Chiefs of Police. Annual meeting. Secretary-Treasurer, A. G. Eversole, Superintendent of Police, 1123 Main Street, Lafayette, Ind.

MAY 14-16.—VANCOUVER, B. C. (125)
American Water Works Association—Pacific Northwest Section. Annual meeting. Secretary, Ernest C. Willard, 720 Corbett Building, Portland, Ore.

MAY 14-16.—LUBBOCK, TEXAS.
West Texas Chamber of Commerce. Annual convention. Manager, D. A. Bandeen, Stamford, Texas.

MAY 15-16.—WASHINGTON, D. C.
American Road Builders' Association. Annual meeting. Engineer-Director, Charles M. Upham, 938 National Press Building, Washington, D. C.

MAY 16.—PARIS, FRANCE. (150)
Association of Garden Cities of France. International Association of Lineal Cities. Annual meeting. Director, George Benoit-Lévy, "L'Etoile," Pessicart, Nice, France.

MAY 19-22.—RICHMOND, VA. (250)
National Association of Public School Business Officials. Annual convention. Secretary, John S. Mount, Inspector of Accounts, State Department of Public Instruction, Trenton, N. J.

MAY 20-21.—OTTAWA, ONT.
Canadian Good Roads Association. Annual Interprovincial Conference. Secretary-Treasurer, G. A. McNamee, New Birks Building, Montreal, Que.

MAY 21-23.—SCRANTON, PA. (100)
Pennsylvania Commercial Secretaries' Association. Annual meeting. Secretary-Treasurer, Patrick Flood, 5921 Pennsylvania Avenue, Pittsburgh, Pa.

MAY 25-29.—PITTSBURGH, PA. (1,000)
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 29 West 39th Street, New York.

MAY 27-30.—BALTIMORE, MD.
National Association of Real Estate Boards. Annual convention. Executive Secretary, Herbert U. Nelson, 59 East Van Buren Street, Chicago, Ill.

MAY 27-31.—ST. LOUIS AND OZARKS, MO. (250)
National Conference on State Parks. Annual meeting. Executive Secretary, Herbert Evison, 905 Union Trust Building, Washington, D. C.

JUNE 1.—WEST BADEN SPRINGS, IND. (300)
American Automobile Association. Annual meeting. General Manager, Ernest Smith, Pennsylvania Avenue at 17th Street, Washington, D. C.

JUNE 1-5.—BERLIN, GERMANY. (1,000)
International Federation for Housing and Town Planning. Congress. Organizing Secretary, H. Chapman, 25 Bedford Row, London, W. C. 1, England.

JUNE 1-5.—BERLIN, GERMANY. (1,000)
International Housing Association. Congress. General Secretary, Dr. Hans Kampffmeyer, Hansa Allee 27, Frankfurt am Main, Germany.

JUNE 2-5.—WASHINGTON, D. C. (300)
National Conference on Weights and Measures. Annual conference. Secretary, F. S. Holbrook, Bureau of Standards, Washington, D. C.

JUNE 3-5.—ASHEVILLE, N. C. (250)
American Forestry Association. Annual meeting. Executive Secretary, Ovid Butler, 1727 K Street, N. W., Washington, D. C.

JUNE 8-13.—LOS ANGELES, CALIF.
Institute of Public Administration. Director, Professor Emery E. Olsen, University of Southern California, University Park, Los Angeles, Calif.

JUNE 8-11.—TORONTO, ONT.
National Association of Purchasing Agents. Annual convention and Informashow. Secretary-Treasurer, G. A. Renard, 11 Park Place, New York.

JUNE 8-12.—ATLANTIC CITY, N. J. (10,000)
National Electric Light Association. Annual convention. Secretary, A. Jackson Marshall, 420 Lexington Avenue, New York.

JUNE 8-10.—HOUSTON, TEXAS. (175)
Texas Commercial Executives' Association. Annual convention and Informashow. Secretary, W. A. Spencer, Chamber of Commerce, Texas.

JUNE 9-11.—GLENS FALLS, N. Y. (700)
New York State Conference of Mayors and Other Municipal Officials. Annual convention. Secretary, William P. Capes, City Hall, Albany, N. Y.

JUNE 14-18.—NEW YORK. (100)
American Community Advertising Association with the Advertising Federation of America. Secretary-Treasurer, Don E. Mowry, General Motors Building, Detroit, Mich.

JUNE 14-20.—MINNEAPOLIS, MINN.
National Conference of Social Work and Affiliated Associations. General Secretary, Howard R. Knight, 277 East Long Street, Columbus, Ohio.

JUNE 15-17.—LUBBOCK, TEXAS. (300)
League of Texas Municipalities. Annual convention. Executive Secretary, Harvey W. Draper, 319 Kress Building, Houston, Texas.

JUNE 16-18.—TORONTO, ONT.
International Association of Comptrollers and Accounting Officers. Annual meeting. Secretary, Carl H. Chatters, Department of Finance, 816 Fidelity Trust Building, Detroit, Mich.

JUNE 17-19.—ST. CLOUD, MINN. (500)
League of Minnesota Municipalities. Annual convention. Executive Secretary, Morris B. Lambie, Director of the Extension Division, University of Minnesota, Minneapolis, Minn.

JUNE 17-19.—MARSHFIELD, WIS.
League of Wisconsin Municipalities. Annual convention. Secretary, Frederick MacMillin, 114 North Carroll Street, Madison, Wis.

JUNE 19-20.—ATLANTIC CITY, N. J. (600)
Eastern Association of Fire Chiefs. Annual convention. Secretary, F. E. Soule, Coatesville, Pa.

JUNE 19-20.—AKRON, OHIO. (50)
Ohio Commercial Secretaries' Association. Annual meeting. Secretary-Treasurer, Russell Frey, Chamber of Commerce, Lakewood, Ohio.

JUNE 21-22.—WISCONSIN RAPIDS, WIS.
Wisconsin Association of Commercial Secretaries. Annual meeting. Secretary-Treasurer, Lee I. Yorkson, Wausau, Wis.

JUNE 22-26.—ASHEVILLE, N. C. (550)
American Institute of Electrical Engineers. Annual summer convention. National Secretary, F. L. Hutchinson, 33 West 39th Street, New York.

JUNE 22-27.—NEW HAVEN, CONN. (3,000)
American Library Association. Annual convention. Secretary, Carl H. Milam, 520 North Michigan Avenue, Chicago, Ill.

JUNE 22-26.—CHICAGO, ILL. (900)
American Society for Testing Materials. Annual meeting. Secretary-Treasurer, C. L. Warwick, 1315 Spruce Street, Philadelphia, Pa.

JUNE 22-23.—LAKE WORTH, FLA. (30)
Florida Commercial Secretaries' Association. Annual convention. Secretary-Treasurer, George F. Sampson, Winter Haven, Fla.

JUNE 22-24.—ROCHESTER, N. Y.
National Conference on City Planning. Secretary, Flavel Shurtleff, 130 East 22d Street, New York.

JUNE 23-25.—DURANGO, COLO. (75)
Colorado Municipal League. Annual meeting. Secretary-Treasurer, Don C. Sowers, University of Colorado, Boulder, Colo.

JUNE 23-26.—BOSTON, MASS.
New England Association of Fire Chiefs. Annual convention. Secretary-Treasurer, John W. O'Hearn, 99 Main Street, Watertown 72, Mass.

JUNE 23-26.—CLEVELAND, OHIO, AND LONDON, ONT.
Ohio State Police Chiefs Incorporated. Annual convention. Secretary, E. G. Krause, 1020 Guardian Building, Cleveland, Ohio.

JUNE 24-26.—ESTEVAN, SASK. (100)
Union of Saskatchewan Municipalities. Annual convention. Secretary-Treasurer, W. E. Hodge, 507 Scott Block, Moose Jaw, Sask.

JUNE 25-26.—CALGARY, ALTA. (95)
Union of Alberta Municipalities. Annual convention. Secretary-Treasurer, J. E. Fraser, Wetaskiwin, Alta.

JUNE 25-26.—NEW SMYRNA, FLA. (450)
Florida League of Municipalities. Annual meeting. Secretary-Treasurer, E. P. Owen, 1201-05 Lynch Building, Jacksonville, Fla.

JUNE 25-26.—STATE COLLEGE, PA.
Pennsylvania Water Works Operators' Association. Annual convention. Secretary-Treasurer, I. M. Glace, 506 South Office Building, State Capitol, Harrisburg, Pa.

JUNE 27-JULY 4.—LOS ANGELES, CALIF., (10,000)
National Education Association of the United States. Annual meeting. Secretary, J. W. Crabtree, 1201 16th Street, N. W., Washington, D. C.

JUNE 30-JULY 3.—GRAND RAPIDS, MICH. (300)
Smoke Prevention Association. Annual convention. Secretary, Frank A. Chambers, 1411 City Hall Square Building, Chicago, Ill.

AUGUST 2-15.—EVANSTON, ILL.
National Institute for Commercial and Trade Organization Executives. Secretary, John N. Van der Vries, 607 First National Bank Building, Chicago, Ill.

AUGUST 27-29.—YONKERS, N. Y. (200)
National Shade Tree Association. Secretary-Treasurer, Dr. Rush P. Marshall, Yale University, New Haven, Conn.

SEPTEMBER 24-26.—NEW YORK. (150)
International Association of Public Works Officials. Annual convention. Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

SEPTEMBER 28, WEEK OF.—TORONTO, ONT. (350)
American Institute of Park Executives and the American Park Society. Annual convention. Executive Secretary, William H. Walker, 224 Wakewa Avenue, South Bend, Ind.

SEPTEMBER 29-OCTOBER 2.—BOSTON, MASS.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

OCTOBER 5-9.—TORONTO, ONT.
National Recreation Association. Annual Recreation Congress. Secretary, Recreation Congress Committee, Thomas E. Rivers, 315 Fourth Avenue, New York.

OCTOBER 7-10.—LOUISVILLE, KY. (250)
International City Managers' Association. Annual convention. Executive Secretary, Clarence E. Ridley, 923 East 60th Street, Chicago, Ill.

OCTOBER 12-15.—ST. PETERSBURG, FLA. (400)
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

OCTOBER 12, WEEK OF.—CHICAGO, ILL. (7,000)
National Safety Council. Annual Congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 14-17.—HAVANA, CUBA. (1,200)
International Association of Fire Chiefs. Annual convention. Secretary, James J. Mulcahey, Fire Chief, Yonkers, N. Y.

OCTOBER 19-23.—PITTSBURGH, PA. (200)
American Society of Municipal Engineers. Annual convention. Secretary, C. W. S. Sammelman, 4359 Lindell Boulevard, St. Louis, Mo.

OCTOBER 27-30.—JACKSONVILLE, FLA. (300)
International Association of Municipal Electricians. Annual convention. Secretary, W. H. Harth, Columbia, S. C.

GROWING PAINS

"CATERPILLAR" Tractors serve well the city with a future — the city that constantly extends its streets, builds new airports, new parks and municipal golf courses. They speed up new work — to the eternal gratitude of taxpayers and voters. Bought first for one major task, they prove wide usefulness at a score of odd chores. Traction and power, of course — but above all else "Caterpillars" bring long life and versatility.

Prices—f. o. b. Peoria, Illinois

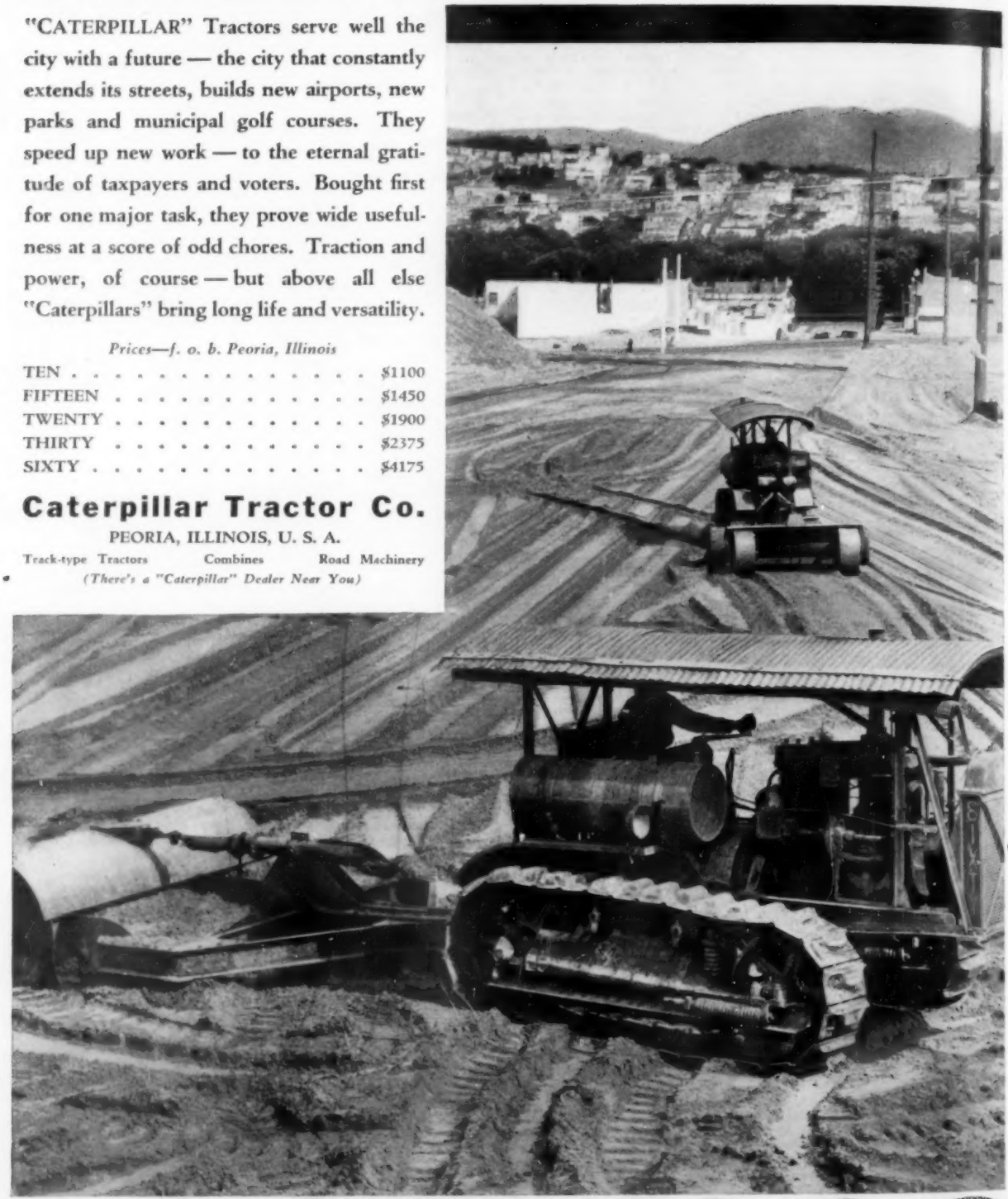
TEN	$1100
FIFTEEN	$1450
TWENTY	$1900
THIRTY	$2375
SIXTY	$4175

Caterpillar Tractor Co.

PEORIA, ILLINOIS, U. S. A.

Track-type Tractors Combines Road Machinery

(There's a "Caterpillar" Dealer Near You)



CATERPILLAR

REG. U. S. PAT. OFF.

NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

HAUCK ONE-MAN WEED BURNER

Kerosene- or Oil-Burning Weed Burners

Burning weeds on highways, between sidewalks and curbs and in gutters, and on vacant property, kills the seeds and does the job quickly. The Hauck No. 372 weed-burner equipment, made by the Hauck Manufacturing Co., 105 Eleventh Street, Brooklyn, N. Y., is simple to operate. After filling the tank, a few minutes' pumping will produce from 40 to 60 pounds pressure, sufficient to operate the weed burner continuously for several hours. When the pressure gets low, a few strokes of the pump raise the pressure for several additional hours' operation. The burner is preheated for 5 minutes, and the equipment is then ready for operation.

This machine is the result of the company's long experience in making oil-burning equipment. Clogging or carbonization is reduced to a minimum. A cast iron nozzle at the flame outlet protects the coil and shell and assures longer burner service. The removable burner coils are made of seamless steel tubing, specially treated to remove scale. Each burner is furnished with oil needle valve, removable basket, oil strainer and brass union connections.

The 3- and 5-gallon fuel tanks are of welded steel, tested at 65 pounds pressure with safety check-valve hand pump, making it impossible to pump more than 45 pounds pressure into the tanks. The 12-, 15- and 20-gallon tanks are of seamless pressed steel, bottom inserted, interlapped and brazed, and are tested at 300 pounds hydrostatic pressure. Before painting, all tanks are tinned inside and out to make them rustproof. All spuds are welded, there are no soldered joints, and pressure gage, fittings and valves are of the best materials and workmanship available. The tanks have special filler caps which can be tightened by hand. The pumps are made of heavy brass, are of unusually long stroke and quick-acting. Special oil-resisting interwoven rubber hose is supplied with ground brass unions.

The equipment consists of a 5-gallon tank, a 12-foot length of oil hose, and the burner with carrying handle and leather shoulder strap. The burner flame is 3½ inches in diameter and 30 inches long and produces a temperature of 2,000° F. The burner itself weighs 18 pounds and the entire equipment 39 pounds. It is made in larger size with 15- and 20-gallon tanks on a hand wheel truck.

An Improved Elevating Grader with 42-Inch Engine-driven Carrier

The new model Austin Contractor's Special elevating grader, sold by The Austin-Western Road Machinery Co., 400 North Michigan Avenue, Chicago, is now completely equipped with anti-friction bearings on the carrier rolls and ground wheels.

A very important feature of this Contractor's Special is the motor-driven carrier. On certain work where a medium-sized tractor must pull the grader and plow and operate the carrier, there may not be enough power to secure a full-capacity output. It always takes more energy to start a loaded belt before it reaches a given traveling speed, and if the tractor supplies that power, just that much is taken from the plow, after which a smaller but certain amount of power is still diverted from the actual plowing operation. When the carrier is engine-driven, the maximum capacity of the grader can be developed regardless of soil conditions or land contour. Further, with this motor-driven belt, the traveling speed can be varied, always to secure the proper rate of discharge whether the work be that of casting or of loading wagons.

Power for the carrier is provided by a heavy-duty 6-cylinder engine mounted in a strong sub-frame and so positioned on the grader that its weight counterbalances that of the carrier, thus equalizing the load on the two sides of the front bolster. The carrier head drum is made of steel instead of wood and is covered with rubber lagging. The drum shaft is supported on each end by two large roller bearings. The belt-supporting rollers are also made of steel and are hollow with shafts passing through them and ball bearings encased in the ends of each roller in grease-tight compartments. These shafts are also of the dead type, and as their ends are anchored to carrier side rails, they serve still further to strengthen the framework. The idler roller at the bottom of the carrier is also supported by large roller bearings. The roller gudgeons are hardened and ground, and the most approved means are used for keeping grease in and dirt out.

The carrier sideboards are made of steel instead of wood and are several inches higher. The guard rollers beneath the upper end of the carrier, which protect it from contact with wagons or trucks, have been made 12 inches longer than formerly, and the framework supporting these rollers has been doubled in strength.

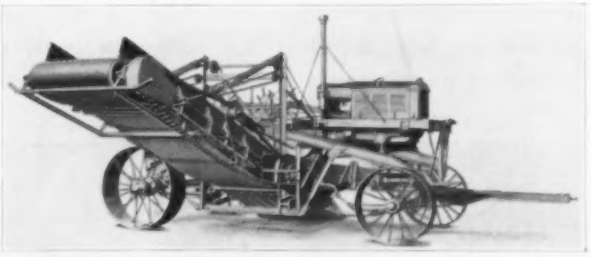
The standard carrier is 22 feet long, which is satisfactory for ordinary jobs of casting and wagon loading. When it comes to building wide country roads by the casting method, however, or loading extra-high trucks, a 25-foot carrier is needed and can be furnished.

The 42-inch belt is of the new Super-Wear quality. The Austin spiral pan cleaner has been increased in efficiency by the use of drive gears with extra-long cut, rather than cast, teeth, and it has a redesigned spiral which is so shaped that it requires no welds. The spiral is gear-driven from the lower roller and its operation is continuous.

Each ground wheel contains two large-sized roller bearings which are easily kept in adjustment and run in grease from which all dust is excluded. Formerly, the front and rear axles rotated in their bearings; now the wheels rotate on dead axles, which thereby become a part of the frame structure and reduce rather than increase strain.

Searight Joins Libbey Cataphote Corporation

The Libbey Cataphote Corporation, Toledo, Ohio, has announced the appointment of William H. Searight to its staff, to handle the development of sales of Cataphote reflecting buttons and other reflecting devices in the automotive, railroad, railway traffic and advertising fields. Mr. Searight was formerly Assistant Sales Manager of the Top Ground Loader Department, Joy Manufacturing Co., Franklin, Pa.



THE NEW AUSTIN CONTRACTOR'S SPECIAL ELEVATING GRADER

18 Years of Reliable Service Behind— Prolonged Years of Even Finer Service Ahead

Commercial transportation standards are invariably set by Reo. Eighteen years ago, Reo first introduced light, more-power-for-weight, speedier, safer, lower-cost SPEED WAGONS, and has maintained engineering dominance ever since.

Hundreds of thousands of REO SPEED WAGONS and TRUCKS have been placed in operation in 64 countries, hauling structural steel down congested Broadway, bringing Brazilian coffee to coastal shipping ports, or patrolling the vast desert stretches along the Great Wall of China!

The same story of day-in-day-out reliability and astounding infrequency of repair has travelled the world around, and has won universal acceptance for REO products.

In face of these irrefutable results, the REO is deserving of a lasting place in your system of transportation service.

REO MOTOR CAR COMPANY, LANSING, MICHIGAN

SPEED WAGONS REO AND TRUCKS

During May we hope you will remember to mention THE AMERICAN CITY

Water Meters of the Disc Type

Complying with the standards of the American and New England Water Works Associations, Phoenix disc water meters, made by the Phoenix Meter Corporation, 50 Church Street, New York, are recognized for their simplicity of component parts and absence of screws.

The disc piston is of hard rubber, made in three parts and held together by a bronze pin. The disc chamber fits into the main casing with a one-degree taper and is readily forced out by freezing, and easily taken apart for inspection. It is made in two parts, machined to a snap joint and fitted with a thrust roller operating in the vertical slot. The register is made of brass, nickel-plated, and all spindles run in hard-rubber bushings. The registers are of the straight reading or round reading types and are furnished in gallons or cubic feet.

The bottom cap of the meter is of cast iron, brass-lined if desired. All bolts, nuts and washers are bronze. The change gears are not fastened with screws, but are fitted with a phosphor bronze plate that acts as a spline.

The gear train has a reduction of 256 revolutions to 1 and has rugged teeth of the special design cut on an 18-degree spiral. This gives a shearing action to the teeth in the arc of approach and takes over 30 per cent of the horizontal thrust off the side spindles, converting it into vertical thrust upon the housings. Thrust action is almost balanced in the side and center gears and has a downward thrust on a ball seated in the driving spindle bushing and an upward thrust on the stuffing-box spindle.

A New Paving Material

The paving problems of city officials involve more than the mere surfacing of streets. Various other areas must also be paved, including parking spaces, walks and drives in parks, tennis courts, playgrounds and similar spaces. A paving material to meet all these needs must have certain definite qualities. It should be readily available in large or small lots, be capable of being used without heat or other preparation, be of such quality that it will not deteriorate when stored for indefinite periods, set rapidly so that the paved area can be used at once, and be so easily handled that good results can be obtained by ordinary working crews without extensive experience.

Tarvia-lithic, a ready-to-lay paving material composed of selected aggregate and a special grade of Tarvia and manufactured by the Barrett Co., 40 Rector Street, New York, is designed to meet these requirements. The material is shipped in open-top cars and can be easily unloaded by hand or by a clamshell bucket. Little equipment is necessary on the construction job. Ordinary rakes, forks and shovels, plus a roller, are all that will be needed. The material can therefore be used economically, even though the yardage of the individual project is small.

DUMPING TARVIA-LITHIC FROM TRUCK FOR HAND SPREADING

In building a pavement top of this material, it is applied in two layers over a suitably prepared foundation, which may be of any type of construction solid enough to support the weight of the traffic. The bottom course is usually from 2 to 3½ inches, loose measurement, in depth. Coarse mix is used for the deeper construction, and intermediate mix for the thin layer. After rolling, this is covered with not more than one inch of fine mix, which is rolled in to fill the surface voids and produce the wearing course.

SPREADING TARVIA-LITHIC WITH A MECHANICAL SPREADER

All sizes of mix can be handled cold and spread on the street or other paved area through a mechanical spreader. This makes possible even distribution at low labor cost and results in a smooth-riding surface.

Foreign Agents Appointed for Paradon

The Paradon Co., Arlington, N. J., manufacturers of chlorinators, ammoniators and dry chemical feeders, announce the appointment of the following foreign agents: F. Hegenbarth, La Ceiba, Rep. de Honduras; Compania de Machinas do Brazil, Caixa Postal 377, Recife Pernambuco, Brazil, and Caixa Postal 2224, Rio de Janeiro, Brazil; Antiga & Co., Apartado 1052, Havana, Cuba.

Winners in International Tank Design Competition

The International Competition, sponsored by the Chicago Bridge & Iron Works, of Chicago, Ill., George T. Horton, President, to develop an esthetic improvement in the character of elevated water tanks, was brought to a conclusion Monday, April 20, at a final meeting of the judges, at which time the following awards were made: First prize of $2,000—Eugene Voita, Chicago; second prize of $1,000—F. D. Chapman and C. M. Goldman, Evanston, Ill.; third prize of $500—Howard W. Vader, Chicago. Honorable mentions, carrying a prize of $100 each, were awarded to Donald A. Blake, Chicago; Geo. A. Hossack, Chicago; Ossip Klarwein and Fritz Hoger, Hamburg, Germany; Mary Ann E. Crawford, Chicago, and Samuel E. Homsey, Cambridge, Mass.

The jury of award consisted of R. W. Zimmerman, architect, chairman, Howard L. Cheney, president of Chicago chapter, American Institute of Architects, and George T. Morton.

The competition, the execution of which covered a period of twenty months, was conducted by Albert M. Saxe, architect, as professional adviser. There were 691 applications to participate, resulting in 152 final presentations of drawings, so unusual and diversified in their scope that it is thought that this contest will result in a veritable renaissance of elevated tank design, which will be felt throughout the entire country.

The drawings will be upon public exhibition for two weeks commencing April 27, after which other exhibitions will be held in response to requests from numerous universities and architectural schools. The first local exhibit will be held on the 7th floor of 430 North Michigan Ave., Chicago.

Plane Speeds Chlorine to Earthquake Victims

Transporting chlorine in an airplane might appear to be a rather hazardous undertaking. But when American Red Cross planes recently rushed emergency supplies to the stricken area in Nicaragua, the chlorine carried was in the safe, highly-concentrated powder form of H T H.

The disastrous earthquake which destroyed the city of Managua and its water-supply system brought disease in its wake to add to the already heavy toll of lives. Chlorine for sterilizing and disinfecting wa[illegible] urgently needed, together with anti [illegible] to avert further tragedy. An appeal sent out to Washington brought quick action.

At 11:30 A.M. on Saturday, April 4, a rush call for H T H came over the telephone from Government officials at Washington to the Philadelphia office of The Mathieson Alkali Works. Less than one hour later, at exactly 12:29 P.M., a special truck delivery from the local warehouse was completed at League Island Navy Yard and the shipment of H T H was placed in the waiting Red Cross plane. At 1:30 P.M., with a supply of antitoxin also on board, the plane took off for Nicaragua.

In another recent earthquake disaster, that in New Zealand, H T H also was rushed to the stricken areas and served to check the outbreak of disease through its immediate use for emergency chlorination. Here again its high concentration and easy application were important factors, although stocks were already on hand with the local agents, S. W. Peterson & Co., Ltd., Wellington, N. Z.

12th Boulevard, looking north from Hickory Street, St. Louis, Missouri. Paved with Trinidad Native-Lake Asphalt in 1923

Heaviest traffic street in St. Louis paved with Trinidad

Three powerful forces — traffic, time and weather—test the wearing qualities and endurance of a paving material. St. Louis will testify —as will thousands of cities throughout the world—that Trinidad makes good on all three tests.

That's because Trinidad gets its durability and its tenacity from *Nature*. Centuries of seasoning gives Trinidad its unique ability to withstand the ravages of wear and weather—as well as a resiliency which absorbs shock, lessens noise and makes it easy to clean and economical to keep in repair.

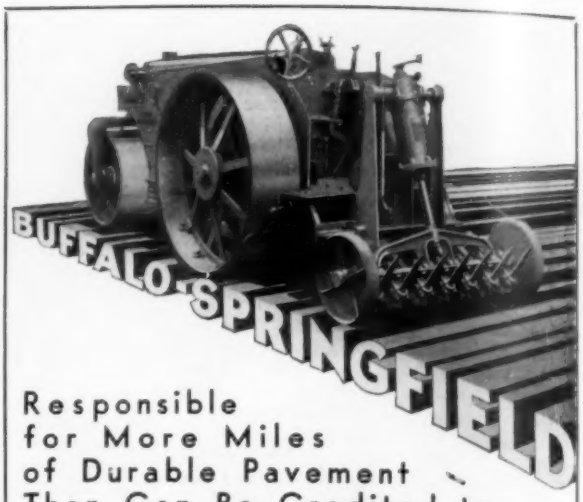
For Road Building—we recommend another Native-Lake product — Bermudez Road Asphalt. Write for proof of its worthiness.

THE BARBER ASPHALT COMPANY

Philadelphia

St. Louis · Chicago · New York · Kansas City · San Francisco

TRINIDAD NATIVE LAKE ASPHALT



Responsible for More Miles of Durable Pavement Than Can Be Credited to All Other Makes Combined

BUFFALO-SPRINGFIELD rollers hold this distinction because they embody the finest features of design and construction known to specialized roller manufacture.

Because they combine rugged strength and reliability with a remarkable ease of handling.

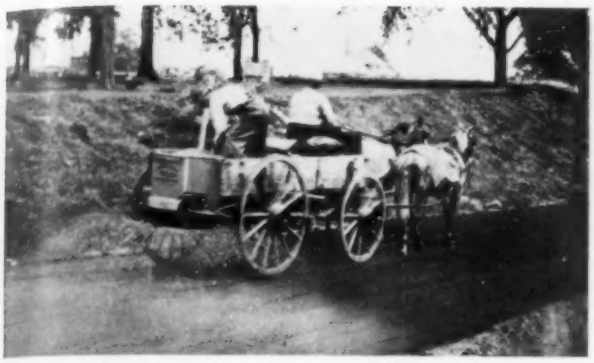
Because they have a reserve of power and stamina far beyond the usual road construction or maintenance requirement.

Built in a wide range of sizes. Steam and motor driven. Scarifier and other attachments optional.

THE BUFFALO-SPRINGFIELD ROLLER CO.

SPRINGFIELD, OHIO

Buffalo-Springfield ROLLERS



SPREADING SAND WITH A HOLDEN LIME SPREADER ON WEBSTER AVENUE HILL, A MAIN ARTERY OF THE RESIDENTIAL SECTION OF PEORIA, ILL.

Four blocks of oiled road were sanded with one load of sand. Barricades were then removed and traffic was able to use the road safely

A Spreader for Sand, Gravel, and Calcium Chloride

Freshly oiled roads do not have to be barricaded if given a light top dressing of sand; in fact, where sand has been used, the road is given a better surface and the oil is not carried off by automobiles. For this work, the Holden Lime Spreader, made by the Holden Co., Inc., Peoria, Ill., will spread sand evenly 20 feet wide. It can be regulated to sow more in the center or to one side, if desired, or can be used to spread evenly over a surface less than 20 feet in width.

By the use of this spreader, calcium chloride can be spread over icy pavements to clear them in a short time, or sand can be spread to make them less dangerous.

On park roads, gravel, sand and shale rock not only goes farther, but is spread more quickly with the Holden spreader. It may be used on a horse-drawn wagon or on a motor truck. For truck mounting a special sprocket wheel is provided.

The spreader may be used with wet or dry material. Material is forced, by the bottom auger, to the ends of the hopper, where it has a straight drop through the two 4½-inch openings, or spouts, direct to the fans by which it is scattered. Two indicator slides under the top agitator of the machine are adjusted by loosening and tightening two thumbscrews. The spouts from which the material drops to the scattering discs can be regulated to drop the sand or other material on different parts of the discs. By this adjustment it is possible to secure an even distribution or, if desired, more in the center or to one side. One side can be shut off entirely by closing the indicator plate.

The wagon-wheel sprocket which drives the spreader fits steel or wooden wheels, with straight or staggered spokes, and wide or narrow tires on a high or low wheel. It is attached to two axle clips and need never be removed, as it does not interfere with the use of the wagon for other purposes. All that is necessary for attaching the spreader is the removal of the end gate of the wagon and the insertion of the machine in its place. No chains or bolts are necessary and there are no holes to bore. The weight of the machine rests on the wagon-bed with perfect balance and no strain on cleats or wagon-box. The spreader is set flush with the wagon-bed, so that it is not necessary to lift the material, and the operator can shovel from the front of the wagon as easily as from the back.

Koppers Company Announces Consolidation of Sales and Distribution

The Koppers Co., Koppers Building, Pittsburgh, Pa., has announced that, effective March 1, 1931, the sale and distribution of all the products of its subsidiaries, the American Tar Products Co., the Koppers Products Co., and the Tar Products Corporation, were consolidated and unified under the name of the Koppers Products Co.

Consolidation of the marketing facilities of these three companies is made in the interest of uniformity and greater efficiency, as well as more clearly to identify the many and various products manufactured and marketed by these subsidiaries under Koppers management.

A New All-Steel Sidewalk Crossing for Railroad Intersections

The majority of accidents which occur to individuals at sidewalk and railroad intersections are due to pedestrians tripping over a defective crossing. Injuries of a more serious nature have developed from pedestrians catching their heels in knotholes or cracks. To eliminate this hazard a new sidewalk crossing has been developed by Joseph T. Ryerson & Son, Inc., Chicago, Ill., made of heavy rolled steel plates, assuring a level, unobstructed walking surface which will last almost indefinitely. Feet have become wedged in flange-ways, resulting in countless lawsuits against railroads. This new crossing is flanged under the ball of the rail so that there is not sufficient space for even small children to wedge their feet. The danger of slipping has been guarded against by providing a raised diamond pattern surface known as Firmtread, which has been used for years for stairs, floors and fire escapes.

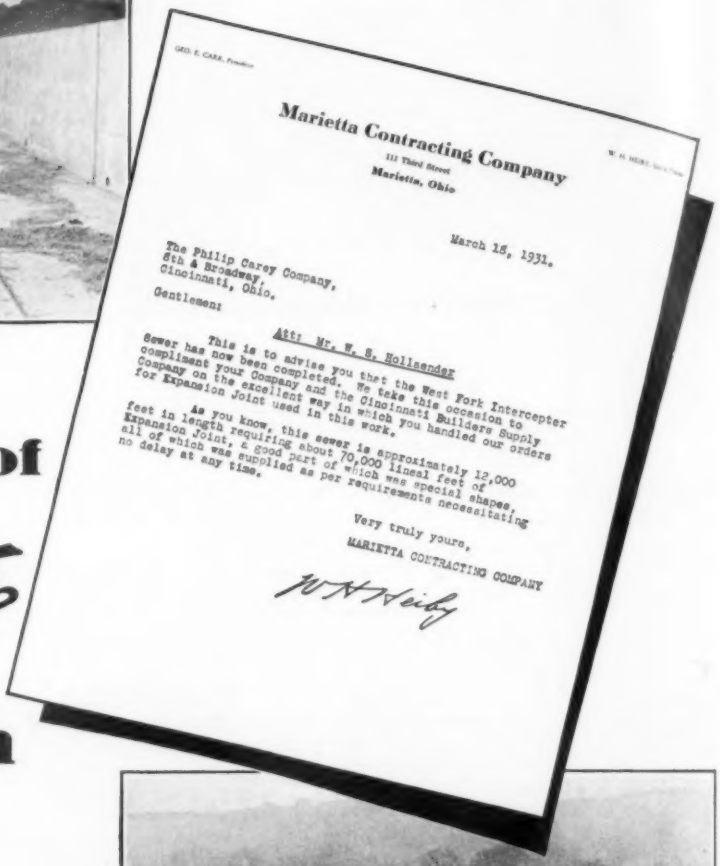
A crossing which will not rot, crack, break, splinter, bulge or become deformed in any way leaves little or nothing to be set aside for upkeep expense. Even corrosion is guarded against on the new crossing by coating the underside of this all-steel installation with tar, asphalt or red lead.

The new Ryerson crossing is constructed in three units, the center and two outer sections. The center section is placed between the rails, with the flanged ends fitting snugly under the ball of the rail on either side. The two outer sections are also flanged under the ball of the rail, and when placed in position, they form a span level with the rails and the sidewalk. The channels and zees which make up the under part of the crossing rest directly upon the ties, assuring the same level walking surface at all parts of the crossing.

In the process of manufacture the ends are formed downward. When the crossing is installed, these ends serve to hold the entire crossing in place, as they are spiked firmly to the ties. With the ends sloped to the ties and fastened securely in this manner, dragging brake beams, dangling chains, etc., on moving trains cannot catch on the crossing. This eliminates the danger of derailments, which have occurred where plank or other crossings were used.

This method of construction eliminates nearly all crossing maintenance expense and also reduces the cost of rail repairs at sidewalk intersections, because of the ease with which the crossing is installed or removed for work on the tracks. Even a gang unaccustomed to this new all-steel crossing cannot reverse the sections or otherwise place them incorrectly. It is stated that thirty minutes are required to completely install or remove it. The three sections are merely placed in position and spiked to the ties.

THE NEW RYERSON PEDESTRIAN CROSSING FOR RAILROAD INTERSECTIONS



Marietta Contracting Company
111 Third Street
Marietta, Ohio

March 18, 1931.

The Philip Carey Company,
6th & Broadway,
Cincinnati, Ohio.

Gentlemen:

Attn: Mr. W. S. Hollsender

This is to advise you that the West Fork Intercepter Sewer has now been completed. We take this occasion to compliment your Company and the Cincinnati Builders Supply Company on the excellent way in which you handled our orders for Expansion Joint used in this work.

As you know, this sewer is approximately 12,000 feet in length requiring about 70,000 lineal feet of Expansion Joint, a good part of which was special shapes, all of which was supplied as per requirements necessitating no delay at any time.

Very truly yours,
MARIETTA CONTRACTING COMPANY

W N Neiby

70,000 feet of Carey Elastite Expansion Joint

"No delay at any time"

Here is another outstanding example of concrete construction—an interceptor sewer 12,000 feet long. Although the Expansion Joint had to be cut to special size, Carey Elastite Joint was delivered as required and on short notice.

Important concrete construction requiring Expansion Joint is almost always protected by Carey Elastite Joint, because the quality of the material and the certainty of its prompt delivery have been proved by 20 years of experience.

A nation-wide organization of distributors, carrying large stocks, insures that any order for standard or special sizes can be delivered on the job in the shortest possible time.

Write for 1931 Price List and Trade Discounts.

THE PHILIP CAREY COMPANY × Lockland, Cincinnati, Ohio
Branches in Principal Cities

BUILT-UP ROOFS
ASPHALT PRODUCTS
ELASTITE EXPANSION JOINT
WATERPROOFINGS
ROOF PAINTS

Carey PRODUCTS EST. 1873

HEAT INSULATIONS
ASBESTOS MATERIALS
CAREYSTONE CORRUGATED SIDING
ASFALTSLATE SHINGLES
BUILDING PAPERS

508

A Truck-mounted Heater and Distributor for Bituminous Materials

An improved small-sized, low-priced distributor which will heat and apply all varieties of bituminous materials now in use for road construction and maintenance in the temperature and volume required is made by the Kinney Manufacturing Co., Boston, Mass., and is known as the Kinney Junior heater and distributor. The tank of this distributor is made of sheet steel, with welded and riveted seams, in either 250- or 350-gallon size. It is fitted with a manhole opening and cover and also with suitable flanged connections for piping. It is provided with interior piping for conveying heat from the burner and also for the circulation of the bituminous material.

The pump is the Kinney rotating plunger type, capable of giving the desired pressure and volume of distribution. It is jacketed and is heated from the auxiliary engine exhaust, thus preventing the hardening of material in the pump. The power for driving the pump consists of a super-powered air-cooled engine adapted to drive the pump by a chain transmission, and controlled by a Kinney friction clutch.

The heating system consists of an oil burner installed in the large lower tube of the tank. This burner generates intense heat under air pressure, the heat being absorbed by the material in passing through the return tubes of the tank, rapidly raising the contents of the tank to a very high temperature without injury. The heat is under the direct control of the operator in degrees of temperature required. Heat may also be supplied to a small portion of the tank contents as conditions may require, by means of a damper shutting off the top set of flues. This damper is operated by means of a link-chain control from the rear end of the tank above the burners.

The piping system is of simple, practical design, and is furnished with a suitable strainer to prevent clogging in the piping or spray nozzles. The spray bars, which are removable, are located at the rear end of the distributor. They are adapted to receive the multiple spray nozzles and are attached to the piping systems by unions. The spray nozzles are inserted at intervals in the spray bars and deliver the material in a series of fan-shaped sprays of the required volume. The maximum width of the spray is 8 feet. There is also a suitable hose and connections with shut-off valves for loading, and for hand spraying. The loading and hand spray hose are of flexible metal with suitable couplings and are provided with a suitable spray nozzle and holder handle. The loading hose is 12 feet long and 2 inches in diameter, and the spraying hose is 15 feet long and 1¼ inches in diameter.

The entire distributor equipment is mounted upon a steel subframe, held by retaining bands and fastened to the chassis frame by U-bolts. It may be mounted on any motor truck the length of the chassis of which is approximately 8 feet from the back of the cab and which is not less than 2 feet 8 inches in width. The equipment may be readily dismounted, should the truck be required for other purposes. Accessories for this distributor include a thermometer for recording the temperature of the material, a pressure gage for the discharge from the pump, a pressure gage for the fuel oil tank, and the necessary tools.

THE KINNEY JUNIOR DISTRIBUTOR

McWane Moves Eastern Sales Office to New York

The McWane Cast Iron Pipe Co., Birmingham, Ala., has moved its eastern sales offices from Philadelphia to New York, where they are established in Suite 1408, Lord Court Building, 40 Exchange Place. Porter W. Allen, for some years in charge of the Philadelphia offices, has moved to New York and continues as Eastern Sales Manager.

While the removal is stated to be due to the growing importance of New York as headquarters for large buyers of water-works materials, it will also enable the company to maintain a closer touch with its New England trade, without lessening its long-established and close contacts in the territory contiguous to Philadelphia.

The Business Organization of Modern Municipalities

The modern municipality is just as much a business organization as are the mills and factories within its limits. The municipality has its overhead expenses, it has its income, and it should have its profits as well. For it is only through a certain margin of profit that funds can be obtained to take care of city expansion and replacements for the various departments.

But because of competition in business today, the mills and factories have studied their economics more than the municipality. The former have cut down on this, put a stop to that, in an effort to widen the margin of profit.

Water departments must do the same. They must eliminate waste—the greatest stealer of profits—and turn this into the treasury to increase department funds.

As we all know, one of the greatest sources of waste and lost revenue in the water department is where meter accuracy and facilities for meter testing are lacking. It is interesting to know that in this connection the Hersey Manufacturing Co., South Boston, Mass., has made a series of studies of actual conditions in typical cities. The result of this investigation has been a real contribution to the smaller water departments.

Take but one typical case: A 4-inch compound meter in a Massachusetts city was removed after registering 19,000,000 cubic feet. It was tested and found to be off 5 per cent in accuracy. This represented a loss of revenue on nearly a million cubic feet of water—all due to the inaccuracy of a single water meter.

In the interests of accuracy the Hersey Manufacturing Co. offers to supply at cost all the necessary equipment and engineering help to install a testing service for both large and small capacity meters. Where this equipment is now installed, great savings are reported by the discovery of unknown inaccuracies that were wasteful. In addition to the testing service, the Hersey Manufacturing Co. claims to have another waste eliminator in its compound meter. This meter has certain patented valve features that prevent loss of accuracy at the "cross-over" point.

With greater accuracy of meters and with facilities for quick check-up of meters whose accuracy is questioned, one of the greatest leaks in municipal income will be plugged. And if cities are to be businesslike in their operation of what is truly the greatest business in the world, they will be on the lookout to plug these leaks and make possible a fair margin of income over operating costs.

The Junior distributor, because of its size and maneuverability, is particularly adaptable to handling work on penetration shoulders, on short areas in private driveways and similar jobs where it would be uneconomical to load and operate a larger distributor.

ONE MAN

INSTEAD OF A GANG

TRACKSON High Shovel shows surprising economy on a wide variety of digging and loading operations. Great strength, easy control and high dumping clearance make it ideal for excavating, building shoulders, loading snow or surplus dirt, digging basements, stripping top soil, clearing slides, etc. On average excavating jobs it digs and loads at the rate of 30 to 50 yards an hour. Here is a tractor shovel that can be furnished either with rubber-tired wheels or sure-footed Trackson Crawlers — a digging and loading outfit that is plenty husky for the heavy jobs, yet small and fast enough to work on narrow roads or streets without blocking traffic. Write for folder No. 251. TRACKSON COMPANY, 1322 S. First St., Milwaukee, Wis.

TRACKSON
TRACTOR EQUIPMENT

Why not remember to mention THE AMERICAN CITY?

THE WESTINGHOUSE CEILING PROJECTOR

Ceiling Projector Determines Height of Clouds

A ceiling projector for use at airports and weather bureau stations for determining the height of clouds, fog or haze, has been announced recently by the Westinghouse Electric & Manufacturing Co., Edgewater Park, Cleveland, Ohio. This lighting unit has a narrow beam and a high beam candlepower, and has a definite visible-spot range of half a mile or more.

To determine the ceiling height, it is necessary only to focus the light beam from the projector upon the clouds and to sight through an instrument called the alidade the light spot thus thrown on the clouds. The alidade consists of a telescopic sight mounted on a protractor. When the projector and the alidade are oriented correctly with respect to each other and when the projector is set at a given angle, the pointer on the telescopic sight of the alidade gives directly the altitude of the ceiling, the protractor being marked in feet rather than degrees.

The ceiling projector consists of a drum-type body and ring-type door of cast silicon aluminum alloy mounted in a steel bow. The bow is mounted directly on the transformer case, to which is bolted the base or adapter. The transformer case and the base are of cast iron and are hot galvanized. Full adjustment is provided on the socket for focusing for which peep sights, lining up with cross markers on the inside of the drum, are used. A quadrant and a locking handle are provided at the side of the drum for controlling beam elevation.

The unit may be connected to either 115- or 230-volt lines. The auto-transformer, which supplies the lamp with 35 amperes at 12 volts, has a multiplicity of taps to compensate for all ordinary line drop and draws only 450 watts from the line.

The new alidade is a precision instrument. It is built of bronze parts, all chromium plated, except the height indicating scale, which is of stainless steel with the readings etched on. The error in the scale is less than 5 minutes, or not more than 8 feet in a mile. The indicator, instead of the customary piece of brass bar, consists of a length of bronze tubing with cross-hairs at each end, similar to a telescopic rifle sight. A small chromium mirror is placed at the lower end, so that readings of any height may be made from an upright position.

In addition, the Westinghouse alidade has a built-in cross test spirit level, which gives a constant accurate check on the vertical, making it easy to maintain the instrument always in perfect adjustment.

The Westinghouse ceiling projector has been adopted as standard by the United States Weather Bureau.

Iron Cribbing for Retaining Walls

A new type of cribbing built up from standard formed galvanized Armco ingot iron sections, either 6 or 8 feet in length and held together by a sturdy interlocking device, has been announced by the American Rolling Mill Co., Middletown, Ohio. Exhaustive experimental tests have been made for compression, shearing and bending of the units, both separately and when locked together.

The manufacturers claim several advantages for Armco ingot iron cribbing: first, its economy of installation, as the wall is in service as soon as installed without awaiting an interval for curing; the units are but one-fourth the weight of other known designs, thus reducing transportation costs and the factor of expense in handling; it also eliminates the necessity for special handling equipment, as the wall may be erected by unskilled labor.

These metal units may be dropped without fear of breaking or chipping. Being non-porous, they do not take up water and do not spall under freezing and thawing conditions. Settlement of the foundation soil does not crack the cribbing wall, when properly erected. Because the units are light in weight, they can be placed on foundation soils which would require a pile or caisson sub-foundation if a heavy mass wall were constructed. Another utilitarian quality is that the metal cribbing can be dismantled and relocated without the loss of any units. The height of the wall can also be increased if it is necessary to raise the grade. The face of the wall need not be a straight line, but can be curved, if desired.

The manufacturers call attention to the fact that this metal cribbing is useful for emergency installation. The standard sections can be stocked, and their lighter weight permits rapid transportation, handling and installation when wash-outs or slides occur. Where closed face walls are desired, galvanized metal filler plates have been developed which fit in between the units and prevent the backfill from filtering through. The new cribbing is designed especially for railroad and highway retaining walls, for bridge wing walls and for river and harbor bank protection work, as well as for underwater crib foundations, as large sections can be bolted together before submerging.

A SMALL SECTION OF ARMCO INGOT IRON METAL CRIBBING FOR DISPLAY PURPOSES
The 6-foot header extending into the earth is full length, but the spreaders have been abbreviated for convenience in shipping

Busch-Sulzer Constructs New Erecting Shop

Announcement has been received that Busch-Sulzer Bros.-Diesel Engine Co., St. Louis, Mo., has authorized the construction of a new erecting shop suitable for testing diesel engines of large sizes up to 25,000 horsepower per engine. An extension, including a 75-ton craneway, is to be made to the iron foundry. W. J. Knight & Co., engineers, have been retained to draw plans and supervise the work. The trend toward larger sizes of diesel engines is indicated by recent orders for seven Busch-Sulzer diesels, all larger than 1,000 horsepower, including one 4,000-horsepower engine for the Tucson plant of the Federal Light & Traction Co., one 3,000-horsepower unit for the Public Service Co. of Colorado, and one 3,000-horsepower diesel for Freeport, N. Y.

Trainor Joins Lime Association Staff

The National Lime Association, 927 Fifteenth Street, N. W., Washington, D. C., has announced the appointment of Lee S. Trainor as Chief Engineer of its Construction Division. The use of lime in the construction industry, in mortar, plaster, stucco, concrete, etc., comes under the purview of the Construction Division.

. . . . FOR BIG LOADS, HEAVY LOADS, YOU NEED HEAVY-DUTY TRUCKS

A fleet of Heavy-Duty Dodge Trucks now serving the Department of Public Works, Philadelphia, Pennsylvania

For heavy-duty hauling you need trucks that will haul heavy loads. » » Dodge Heavy-Duty Trucks will do that. They are rugged in design and construction through and through. Everything about them says *heavy duty*. Everything about them says *power*, says *dependability*, says *long life at low cost*. » » Whatever your heavy-duty hauling needs may be . . . whether you must head up steep hills often or over unimproved roads daily . . . there is a Dodge Heavy-Duty Truck for your job. A Dodge Truck that's modern. That's precision-built throughout and correctly balanced part to part for longer life. A truck that's dependable. That's economical. That will work for you and earn for you as no other truck will do. » » See your Dodge Brothers dealer. See and test the Dodge Heavy-Duty Truck that fits your needs. You can buy it complete with standard or special body. You will find it an exceptional value—a loyal worker, a consistent earner.

THE COMPLETE LINE OF DODGE TRUCKS RANGES IN PAYLOAD CAPACITIES FROM 1,200 TO 11,175 POUNDS—PRICED, CHASSIS F. O. B. DETROIT, FROM $435 TO $2695, INCLUDING THE 1½-TON CHASSIS AT . . . $595

TO HELP LOWER YOUR HAULING COSTS OPERATING RECORD BOOK FREE

DODGE BROTHERS CORPORATION A-16
Detroit, Michigan
Send your Operating Record Book. I understand there is no obligation.

NAME_____

ADDRESS_____

CITY_____ STATE_____

Number of Trucks Operated *(Book for each will be sent)*_____

DEPENDABLE
DODGE TRUCKS

FRANK L. WEAVER, OF HERSEY MFG. CO.

Hersey Meter Salesman Dies

Frank L. Weaver, of Columbus, Ohio, who had been with the Hersey Manufacturing Co., corner of E and Second Streets, South Boston, Mass., for 22 years, received injuries in an automobile accident on March 25, 1931, which caused his death on March 27. Mr. Weaver was 71 years old.

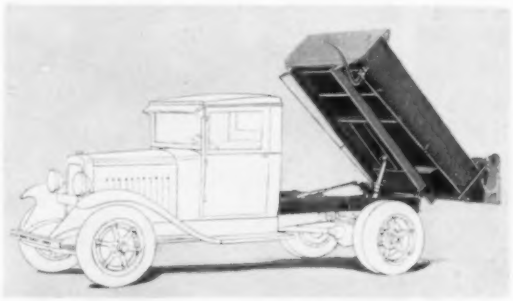
The Sanitary Collection of Refuse

For the clean, odorless, efficient collection of garbage and rubbish, the Walter Motor Truck Co., Inc., Queens Boulevard at 37th Street, Long Island City, N. Y., has brought out the Walter sanitary refuse carrier. The hinged side doors of this truck are unlocked, opened, and locked in open position, or lowered and locked down, with a single motion. Two tight, non-leakable doors are provided on each side of the body. They cannot be left unlocked and they cannot fall down accidentally.

The body has a clean, smooth interior which does not catch refuse. The loading height is less than 4 feet from the curb, giving easy waist-high loading, which is made possible by the extremely low chassis of the Walter front drive. The wide opening gives ample room for the emptying of cans with sticky refuse. The bodies are self-trimming. When the space near the doors becomes filled, it is necessary only to close all the doors and tilt the body so that the material packs toward the rear. The front can then be filled. The bodies have a capacity of 15 cubic yards, so that fewer collection units are required.

For snow-removal work, snow loaders can fill the truck through the six large hopper-shaped top doors, which operate on the same principle as the side doors.

The trucks are driven by a special 6-cylinder heavy-duty motor with removable Ricardo heads, equipped with force feed lubrication and oil filtrator. Cooling is by means of the large demountable vertical oval tube radiator, a 20-inch fan driven by a V-belt, and a centrifugal water pump with 10 gallons water capacity. The transmission is of the patented tractor type with five forward speeds from 1 to 30 miles per hour and one reverse.



THE NEW HEIL WB DUMP UNIT

A New Dump Hoist for Light-Duty Trucks

A hoist and body unit for light-duty trucks, known as the WB dump unit, has been announced by the Heil Co., Milwaukee, Wis. The WB unit consists of a No. 1 Heil single-cylinder hoist mounted in a channel iron supporting frame which fastens to the chassis frame with clips; a Heil power take-off and connected parts; and an all-welded steel body which may be selected. The unit is shipped completely assembled ready for immediate mounting.

The No. 1 Heil hoist is a quick-acting, powerful hydraulic hoist providing a 50-degree body dumping angle. The hoist pump is an integral part of the hoist and is attached to a power take-off working from the truck transmission. Levers conveniently located in the truck can control the raising and lowering of the body.

Non-Skid Floor Plates for Road Tracks, Bridge Plates and Railway Crossings

Safe traction is most important for modern high-speed traction. Central Knobby non-skid steel floor plates, made by the Central Iron & Steel Co., Harrisburg, Pa., in lengths from 18 to 60 inches and longer, and in widths from 6 to 24 inches and thickness from $\frac{1}{8}$-inch up, are used in a variety of ways to effect better traction and safer travel, and to increase the life of highway structures through distributing the load from the wheels over a greater area of bridge floor.

On the Delaware River bridge between Philadelphia and Camden, Central non-skid floor plates are used at the expansion joints. Thus, the expansion crevice is well covered with a plate which will not permit of any skidding by motor traffic on stormy days. These steel floor treads are also used for road-tracks on country roads where it has not been deemed economical to completely repave the entire road, but where the plates could be firmly affixed to the old surface to form non-skid tracks for one-way traffic. The floor plates may also be used to lengthen the lives of wooden bridge floors and railroad or street-railway crossings. The old familiar rattle of loose boards on bridges is overcome through the use of steel floor plates which literally bond the flooring into an integral unit.

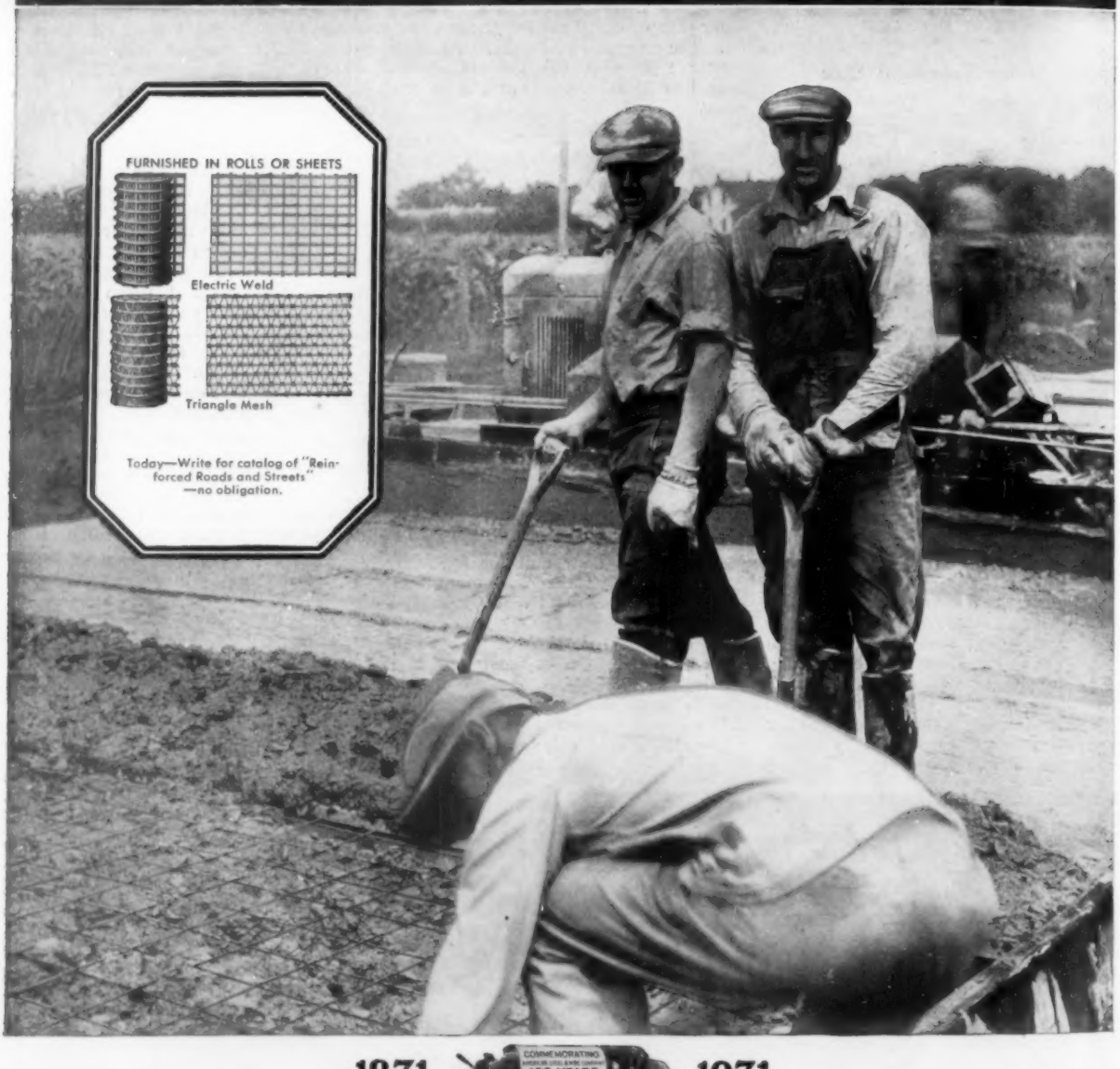
LOADING THE WALTER SANITARY REFUSE CARRIER

AMERICAN STEEL & WIRE COMPANY

WIRE FABRIC

ROADS built today must serve the greatly increased traffic demands of tomorrow. Long pavement life and low maintenance costs are of paramount importance—and these essentials are best provided by the use of wire fabric reinforcement. Experience has revealed to highway departments the reliability of American Steel & Wire Company Wire Fabric—as well as the dependable service in back of it.

REINFORCED ROADS ARE PERMANENT



1831 COMMEMORATING 100 YEARS of PROGRESS in WIRE MAKING 1931

AMERICAN STEEL & WIRE COMPANY

208 South La Salle Street, Chicago SUBSIDIARY OF UNITED STATES STEEL CORPORATION And All Principal Cities

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco *Export Distributors:* United States Steel Products Company, New York

EVERWEAR OCEAN WAVE WITH PROTECTIVE INNER GUARD

A Safe Playground Device

Thirty or more children at one time can safely use the EverWear Ocean Wave, made by the EverWear Manufacturing Co., Springfield, Ohio. The children stand or sit on the ten-sided platform boards and grasp the rigid, circular hand-rail which is strongly attached to the ten suspension bars.

The standard, full-size Ocean Wave is 10 feet high over-all and 11 feet 6 inches in diameter. The Junior Ocean Wave is 6 feet 6 inches high over-all and 7 feet 2 inches in diameter. The normal height of the platform above ground on the standard outfit, when still, is 24 inches. When the safety inner circle touches the rotating bumper wheel, the platform clears the ground by 8 inches.

The top ball and socket rotating and oscillating head is of the EverWear non-removable type and is lubricated by the Alemite-Zerk system. The suspension bars are ¼- x 1¼-inch hot rolled steel. The rigid circular hand-rail is ¾-inch galvanized steel pipe, and the safety inner circle is ½- x 2¼-inch hot rolled steel which is bent in a circle edgewise, giving it strength. The patented rotating bumper wheel protects the post against the cutting action of the safety inner circle and also cushions the shock of contact. The hardwood platform boards are held inflexibly at each joint by malleable iron suspension plates and malleable iron bottom plates.

An inner guard (patent applied for) to shield the safety inner circle so that neither hands nor feet can be crushed between the circle and the bumper wheel is supplied as extra equipment and is recommended as an additional safeguard.

Remote Water-Level Indicators and Recording Meters

Announcement has been made by Wallace & Tiernan Products, Inc., Belleville, N. J., that it has acquired the assets of the Tanner Engineering Co., Long Island City, N. Y., and in the future the manufacture and sale of Tanner instruments will be carried on by this organization. These instruments indicate and record variation in liquid levels, vertical movements of gas holders, position of valves and sluice-gates, and any straight line or angular motion, at any distance from the point of measurement.

Knowledge of water storage conditions is essential to the successful operation of hydroelectric systems. Permanent records of day-by-day changes correlated with plant-operating data make accurate future planning possible. Power generation may be anticipated, distribution arrangements made, and future construction requirements forecast. This information is available with the use of Tanner instruments. Electrically operated transmitters installed at the various ponds with indicating, recording instruments at the power station will constantly indicate the water levels for control of operation and permanently record this information for future use.

This is also true of water-supply systems. Consumption may be anticipated when a knowledge of water conditions in storage reservoirs, clear wells and elevated tanks is immediately available. Tanner instruments measuring the levels and transmitting this information directly to some central point, such as the pumping station or water superintendent's office, often prevent dangerous water shortages through unexpected draft on reserve storage.

At the Saluda Dam in South Carolina, these instruments are used to measure the positions of the eight sluice-gates and indicate these positions at the power plant. From previous calibrations of these openings, the amount of water going to each wheel can be determined and turbine efficiency checked. Remote operation of the gates is checked from the plant by the reading of the indicators.

A Waterproof Building Paper for Curing Concrete Roads and Sidewalks

A reinforced waterproof building paper which combines strength and pliability is being manufactured by the United Paper Co., East Braintree, Mass., under the name Tufcote. The use of this airtight, waterproof reinforced material for curing concrete roads and sidewalks, as well as concrete floors, eliminates the use of burlap, earth ponding, sawdust and other methods of curing.

Tufcote consists of two layers of extra-strong high-quality Kraft paper cemented together with asphaltum and reinforced lengthwise and crosswise with a tough, strong interwoven jute fabric.

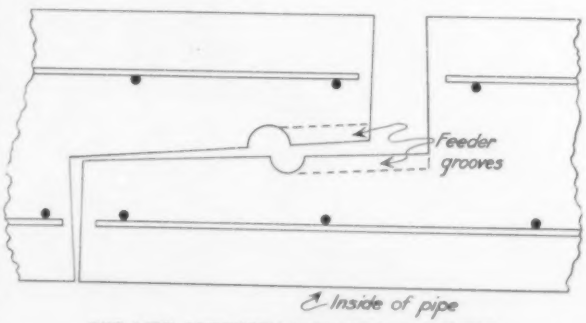
In a recent report by an outstanding Highway Engineer, connected with the State Department of Public Works in one of the New England States, a material saving in the cost of curing a test section of concrete highway was shown between the use of Tufcote paper and a deliquescent salt spread on the surface. The actual cost per yard for the paper was 2.89 cents, which included the cost of the material, spreading it and removing, while the cost of spreading the salt was 4.59 cents, which included the cost of the salt, spreading, brooming, the cost of burlap, placing and removing the burlap. Test beams from these sections showed that the concrete cured with the paper gave practically equal results.

An Improved Joint for Concrete Sewer Pipe

A new joint which makes it possible to use reinforced concrete pipe effectively for sanitary sewers where leakage or infiltration must be eliminated, has been developed by the Newark Concrete Pipe Co., 323 Broadway, Newark, N. J. In this joint the self-aligning feature of the standard Newark joint is retained, but sufficient annular space is provided so that the sealing compound can seal the joint securely. In addition, the fit of the pipe is close enough to make it unnecessary to put a sealing band in the interior of the pipe to keep the sealing material from leaking into the pipe when the joint is being poured.

With this joint and where conditions permit or make it advisable, any type of sealing compound can be poured; and yet, with this same joint, it is possible to use a sealing compound in a plastic form.

The special joint material which has been developed by Robert Burtnett, of the Engineering and Inspection Department, Westchester County Sanitary Sewer Commission, White Plains, N. Y., can be used as a plastic or can be poured, and its principal and most important characteristic is that, although it sets up sufficiently so as not to flow under the action of water pressure, it never becomes so rigid that it is brittle. For this reason, slight settlement of the pipe line will not break the joint, as would be the case where a brittle material such as mortar is used. The joint material can be poured cold, so that the difficulties incidental to pouring hot material are avoided.



THE NEW BURTNETT JOINT FOR CONCRETE SEWER PIPE

INDUCTION CONTROL

Variable Speed (Induction Motor) Controls are used for the operation of electric STOP and GO signals at isolated intersections where an easily adjustable, total time-cycle range is required, and where the signals at such intersections are not required to keep in step with adjacent intersections. They are also used for the timing of systems of signals operated synchronously or staggered.

The A. G. A. Variable Speed (Induction Motor) Control, provides maximum selectivity and flexibility. Its features include very long or short cycles and adequate means for splitting these cycles into suitable periods.

The amber periods, for the north and south indication and for the east and west indication, are independently adjustable.

All parts of the timing mechanism are completely housed. This housing is hinged to the control cabinet. The cabinet also contains panel with wiring terminals, switches, fuse, block and radio interference eliminator. All A. G. A. controls are furnished standard with flashing amber for use if required, and are wired for all standard color sequences.

Full information will be sent or a representative will call upon request.

AGA SIGNALS

TRAFFIC ENGINEERING DIVISION

AMERICAN GAS ACCUMULATOR COMPANY

ELIZABETH, NEW JERSEY

New York Boston Buffalo Chicago Pittsburgh Philadelphia St. Louis

A Good Sign *is* Economy

SUPERIOR GALVANNEALED made to meet difficult conditions. It is a Superior Quality, Zinc Coated Sheet Steel especially suited to Signs of all kinds.

Its coating, applied by a patented Heat-Treatment process, will not flake or peel; it is smooth and takes and retains paint, lacquer or enamel; it may be formed or embossed without fracturing; it is highly ***rust resisting.***

It is ***an ideal sheet*** for meeting ***unusual conditions*** successfully. Many of the world's largest sign users specify it exclusively.

Superior Galvannealed PATENTED PROCESS

Sample and Booklet on Request

The Superior Sheet Steel Company

Canton, Ohio

Division of Continental Steel Corporation
General Offices: KOKOMO, IND.
Plants at:
KOKOMO, INDIANAPOLIS, CANTON

Manufacturers of:
Black, Galvanized, Long-Terne and Special Coated Sheets Roofing and Kindred Products; Billets, Rods, Wire, Nails and all types of Fence

THE HELLIGE AQUA TESTER

Low-priced Equipment for Water Analysis

With the advent of the new Hellige Aqua Tester, Hellige, Inc., 179 East 87th Street, New York, have made available to all those interested in making analyses of water, sewage, and industrial wastes, the advantages of their permanent color glass standards. The introduction of these standards marked a new era in colorimetric tests, as they do not fade, are permanently reliable, and all tests are based on the same true values. The disadvantages of liquid color standards, such as fading, time-wasting, rechecking, and expense of replacement, are avoided. The low price of the outfit will commend it to everybody interested in accurate water analysis.

The Aqua Tester consists of a substantial U-shape upright on a heavy iron base. Attached to the upper part of the upright is a platform with hinged cover for holding a color disc with Hellige permanent color glass standards for the various methods. A light shield of proper height to keep off interfering light rays and thus facilitate the color match, is mounted on the hinged cover of the platform and has brackets for a removable mirror. The latter enables the worker to observe the color fields conveniently from a horizontal eye position. Without the mirror the observation of the color fields can be made viewing from the top vertically through the apparatus. Brackets are provided so that the mirror can be used in different height positions, depending on whether the Nessler tubes are applied, or special cells of 13 and 40 millimeters liquid depth for hydrogen ion control, for higher concentrated chlorine solutions or other tests. Mounted on the lower part of the upright is a platform with two sockets for holding the Nessler tubes, and in the middle are spring clips for the same purpose. This arrangement makes it very convenient to insert and remove the filled tubes, which is a matter of a second. A large light shield is provided in front of the Nessler tubes in order to protect the solutions against direct light rays. A white opaque glass reflector serves for the illumination of the liquids in the Nessler tubes or cells.

The Nessler tubes, as offered for this apparatus, combine the advantage of quick filling or emptying and accurate adjustment of the proper liquid height. The tubes have blown-glass bottoms, the outside surface of which is plane ground and polished. The open end of the filled tube is closed with a short, solid glass plunger with plano-parallel ground and polished ends, and automatically adjusts the proper liquid height of 250 millimeters.

The color glass standards are conveniently arranged in a circular frame of almost unbreakable material forming the color disc. By revolving this disc the proper standard is brought into the observation field. The color discs are of convenient size, 85 millimeters, or about 3½ inches, in diameter.

Low Center of Gravity, High Speed Bituminous Distributor

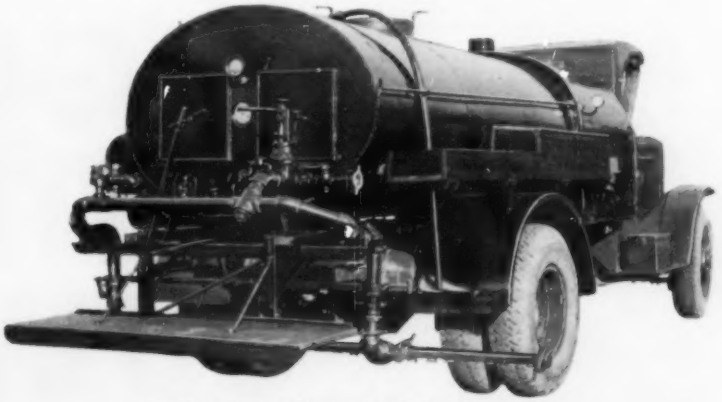
The use of high-speed heavy-duty motor trucks in applying bituminous materials for penetration macadam roads has led to the design of the Type 100-D bituminous distributor by Chas. Hvass & Co., Inc., 508 East 19th Street, New York. The tank of 600, 800, 1,000 or 1,200 gallons capacity is elliptical in shape, of electrical welded construction with four 7-inch flues to carry the hot burning gases forward and return them to the back, and eight 3-inch flues which assist in the distribution of heat through the body of the material in the tank. A stack with a cover is provided at the front end of the tank, permitting hot gases to pass through the length of the tank three times.

The entire outside of the tank shell is covered with 1½ inches of Banroc rock wool. An 18-gage steel sheet covering is placed outside the insulation. The rear head of the insulated housing and the entire pump and piping heating chamber, which receives heat directly from the tank flues, is made up entirely of two sheets of steel between which is placed sheet asbestos. Two removable panels are placed in the rear head so that the flues may be reached for cleaning. A hinged door is placed in the pump housing to give access to the pump and piping for heating with an auxiliary burner when starting.

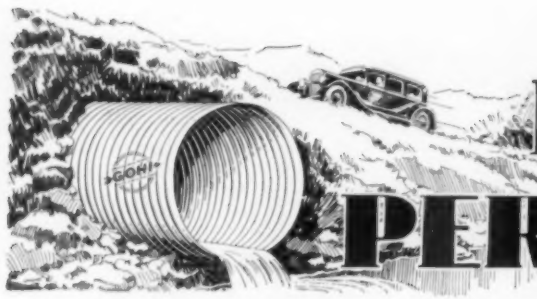
A Viking rotary type pump with 4-inch suction and 3-inch discharge capable of handling 300 gallons per minute is installed to give positive, uniform pressure. A Continental 4-cylinder, 4-cycle, 20-horsepower engine, complete with Eisemann magneto and Zenith carburetor, water-cooled pump circulation and pressure feed lubrication, gasoline tank and radiator, and a Twin Disc clutch, is mounted on steel channel sills set crosswise of the frame between the cab and the tank.

Heating equipment for the tank consists of two large kerosene burners of the torch generating type supported by the equipment frame at the rear of the tank. They are protected by a steel shield and regulated by needle valves. Kerosene for the torches flows by gravity from the supply tank to a ⅜-inch rotary pressure pump which is mounted beneath the engine and driven by it through silent chain and clutch. Kerosene is pumped into the bottom of a pressure tank through a standpipe, thus compressing the air in the tank. The reaction of the compressed air develops the necessary 60 pounds pressure required to operate the burners. The pressure tank is equipped with a pressure gage, relief valve and tire valve, so that air pressure can be injected at any service station, if desired.

The distributor manifold is of the sectional type with a quick-operating connection between the sections. It is made of malleable iron, tapped for 1½-inch nozzles. The standard length manifold is capable of covering up to a 16-foot swath and can be swung from side to side to match swaths or to clear obstructions. The nozzles are brass and give a fan-shaped spray under pressure. Quick-acting cut-off valves are placed near the manifold to eliminate drip.



HVASS TYPE 100-D BITUMINOUS DISTRIBUTOR



In the Ground PERFORMANCE

-that's what counts in a culvert!

GOHI Corrugated Culverts have an outstanding record of actual service *in the ground*. Culverts installed more than twenty years ago show little or no deterioration today.

Such a record proves that GOHI Culverts are not only durable, but have the physical characteristics to hold together as inseparable units to withstand pressure of freezing water, shifting fills, and vibration of heavy traffic — qualities of utmost importance in insuring long, dependable service without trouble or upkeep.

Back of the durability of GOHI Culverts is the rust-resisting base metal from which they are fabricated. This metal is GOHI, guaranteed 99.90% pure Iron-Copper Alloy. It lasts longer because of its extreme purity and copper content.

Add to GOHI Culvert durability the advantages of low first cost, ease of handling, low-cost installation, and you have the lowest-cost-per-year drainage service available. Write today to the nearest GOHI Fabricator for full details.

GOHI FABRICATORS

The Newport Culvert Co.
Newport, Ky.

The Pennsylvania Culvert Co.
Philadelphia, Pa.

Denver Steel & Iron Works Co.
Denver, Colo.

A. N. Eaton, Metal Products
Omaha, Nebr.

Feenaughty Machinery Co.
Portland, Oregon

Tennison Brothers
Texarkana, Ark.

Capital City Culvert Co.
Madison, Wis.

Central Culvert Co.
Ottumwa, Iowa

Roanoke Sales Corp.
Roanoke, Va.

St. Paul Corrugating Co.
St. Paul, Minn.

Tennison Brothers
Oklahoma City, Okla.

GOHI CULVERT MANUFACTURERS, Inc.
Newport, Kentucky

(GOHI Corrugated Culverts meet copper-bearing pure iron requirements in all accepted specifications for corrugated metal culverts).

GENUINE OPEN HEARTH IRON
GOHI
TRADE MARK
PURE IRON - COPPER ALLOY
REG. U.S. PAT. OFF.

GOHI
PRONOUNCED "GO-HIGH"
Corrugated CULVERTS

HAZARD ARMORTITE CABLE

Armored, Moisture-proof Underground Cable

An armored, moisture-proof underground cable which may be installed directly in the soil without conduits, is made by Hazard Insulated Wire Works, Wilkes-Barre, Pa. The insulated conductors of this cable are protected against moisture by an asphaltic-base non-hardening plastic sealing compound, and against mechanical injury by asphalted jute coverings and non-metallic tape armor.

Having neither lead sheath nor steel armor, Hazard Armortite cable is light in weight and therefore low in transportation cost, easy to handle and moderate in cost. The non-metallic coverings make the cable specially advantageous when used in single conductor form on A.C. circuits.

Some of the uses of this cable include street-lighting installations where the 20-ampere system is used, airport wiring, rural light and power lines, underground distribution systems in modern subdivisions, underground service to buildings, bridge wiring, athletic field lighting, fire alarm, police signal and traffic control, railroad track circuits, and power lines between factory buildings.

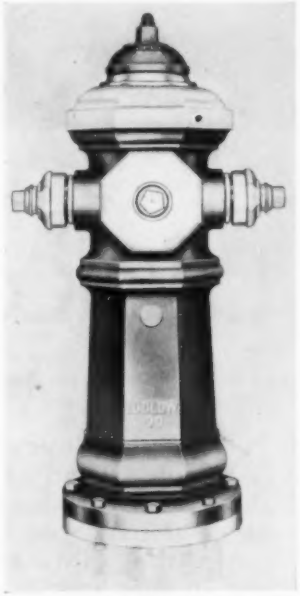
One of the secrets of the long life of this cable is the thorough saturation of the jute coverings with asphaltum compound by the vacuum and pressure method, which prevents rotting of the jute from the effects of moisture and soil acids. The plastic sealing compound is non-hardening and non-migrating, and permits working of the cable within a temperature range of zero to 120 degrees Fahrenheit. Even at 10 degrees below zero, with ordinary care, the cable can be installed without injury and will withstand temperatures as high as 160 degrees Fahrenheit without injury.

Hazard Armortite cable may be laid in the same manner as parkway cable. A trench is dug directly in the soil, 12 to 18 inches deep and spade width, the cable dropped in and covered up. Where the cable crosses a roadway, it should be protected by planks or other means to prevent crushing by the pressure of heavy traffic. If laid under the pavement in the gutters, it need be installed only a few inches below the bricks, concrete or asphalt. Its flexibility enables it to be looped around obstructions such as tree roots or boulders.

In subdivisions and parks or in laying rural lines, it is frequently possible to save considerable expense by using a cable plow, which is available on short notice on a moderate rental basis. To plow the cable in, it is first laid out on the surface in the approximate position, the starting end is fed into the funnel opening in the tube which leads it to the foot of the plowshare 18 inches under the ground. As the tractor pulls the plow along the ground, the cable feeds in and is thus quickly and economically laid with very little surface disturbance and no necessity of backfilling. The plow measures 8 feet by 3 feet x 14 inches and weighs approximately 750 pounds.

New Fire Hydrant Has Unusual Features

Conspicuous and ever necessary, the fire hydrant should be in keeping with modern street-lighting standards, traffic towers and highway sign posts, which have already contributed much toward making city streets attractive. It should be an asset rather than a detriment to any location, for it is a necessary fixture before the modern office building, the park entrance, in the high-class apartment section and along the fine suburban avenue.



LUDLOW DIAMOND FIRE HYDRANT

Recognizing this, the Ludlow Valve Manufacturing Co., Troy, N. Y., has introduced a new fire hydrant known as the Ludlow Diamond. The manufacturers made a thorough study of modern architecture and highway equipment before selecting this new octagonal shape. The eight flat surfaces, especially on the dome and caps of the hydrant, provide eight light-reflecting planes. When the dome and caps are painted with aluminum paint, the hydrant becomes practically self-illuminating and locates and identifies itself even by day. At night it is easily seen, as these surfaces will reflect any light. The design also lends itself to decorative effects in black, orange and silver, black, red and silver or any other combination.

The body of the hydrant is not integral with the barrel, but ends in a flange which is bolted to the barrel flange just above the ground line. The bolt holes are so arranged that the hydrant nozzles can be set in any direction required, without disturbing the hydrant bottom or lead from the main.

The hydrant body is so designed that any breakage caused by impact with a heavy truck, for instance, will occur just above the flange. By releasing eight bolts the old body can be removed and a new one substituted without digging.

Changes have also been made in the hydrant bottom which employs the Ludlow gate valve, the gate being lowered free and forced squarely against its seat by a wedge nut at the back of the gate. Through a few simple improvements in design, the lines of force are now opposed and directed downward, so that once the gate is closed with the drip valve open, it cannot be pulled free and can be released only by turning the valve stem. Even if the hydrant body is broken, the valve will not cause a flood.

Variations in grade can be handled by selecting the proper length of connecting barrel. Since the hydrant body and bottom are standard for each size, it is merely necessary to stock a few of these in the proper sizes, as the correct depth is taken care of with flanged connecting barrels of suitable length.

New Dump-Body Attachment for Power Graders

Of particular value to those communities that have power-grader equipment but do not have motor trucks, or where motor trucks may be needed for other purposes, is the new dump-body attachment for power graders recently brought out by the W. A. Riddell Co., Bucyrus, Ohio. This dump body has a capacity of 1½ cubic yards and can now be furnished on Warco center-control power graders. Dumping may be either by gravity or mechanical, as desired.

The outfit appeals to officials in charge of city and rural roads where patching is necessary at the same time that maintenance is required. The operator can start out with a load of patching material, filling in the necessary holes along the way and then blading down the material to form a smooth roadway, all in one operation.

DUMP-BODY ATTACHMENT ON WARCO POWER GRADER

It's a Quicker LESS COSTLY WAY *with* CLETRAC

NINE times out of ten when these powerful, sure-footed Cletrac Crawlers take over a job they upset all former operating standards. With their faster travel they put new speed into schedules. They trim down costs through their remarkable economy of gas and oil and smaller service requirements. Their higher percentage of delivered working power gets extra capacity out of equipment and permits bigger loads.

Regardless of the kind of work—handling a scraper train, pulling an elevating grader, pushing a bulldozer, or doing any one of scores of outdoor jobs—Cletrac Crawlers put new vim and vigor into the operation and save a great many dollars in a season's time.

Cletrac Crawlers are built for rough going and tough tasks. They handle easily with their simplified controls and patented planetary gear steering. All models have automatic lubrication which does away with daily hand oiling and greasing and safeguards the tractor against neglect or service oversights.

Cletrac Crawlers are built in a complete line of five sizes with deliveries of from 15 to a maximum of 80 horsepower.

Cletrac Crawler Tractors

Get in touch with a Cletrac dealer for a demonstration and first hand facts about these better tractors — or write direct for literature and information.

THE CLEVELAND TRACTOR COMPANY
19326 Euclid Avenue CLEVELAND, OHIO

INSTALLATION OF BENJAMIN PIT AND TUNNEL LIGHTING FIXTURES IN GOOD STREET UNDERPASS, DALLAS, TEXAS

New Tunnel and Viaduct Lighting Fixture

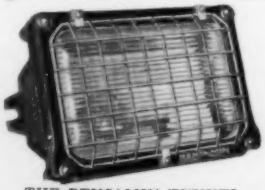
A new fixture for the lighting of tunnels, viaducts and underpasses has recently been placed on the market by the Benjamin Electric Manufacturing Co., Des Plaines, Ill. This unit is of the heavy-duty type and is built into the side wall or ceiling. It is moisture- and vapor-proof. The body is made of heavy castings, giving great strength and rigidity. The conduit enters from the side, the body of the fixture forming its own outlet box.

Among the unusual features of this fixture is the special porcelain-enameled reflector which assures maximum flux of light, which is controlled and directed by a heat-resisting refracting glass cover, to the place most needed. This gives a maximum illumination on side walls, roadway and curb, and objects within the tunnel or underpass are clearly visible.

In two-channel underpasses, the fixtures are usually installed in the upper part of the side walls. In single traffic channels, the fixtures are installed in the ceiling. The refracting glass cover directs the light so that the front and near side of approaching vehicles and the rear end of preceding vehicles are well illuminated, without any disturbing glare in the eyes of the drivers.

The accompanying illustration shows an installation of these fixtures in the Good Street underpass at Dallas, Texas. This installation includes 104 Benjamin No. 5710 pit and tunnel lighting fixtures with plain glass covers, using 150-watt lamps. The units are set in the concrete at a 30-degree angle, spaced 19 feet, 6 inches apart and mounted within 10 inches of the ceiling. They are staggered so as to provide a unit about every 10 feet. The foot-candle intensity is 3 on the floor of the vehicle channels and 5 on the floor of the pedestrian channel.

The two channels for vehicles are each 15 feet wide and 14 feet high. The channel for pedestrians is 8 feet wide and 10 feet high. The tunnel is 348 feet long, the color of the walls being cement gray. The ordinary cement finish of the walls was made smooth by wetting and rubbing with a carborundum block.



THE BENJAMIN TUNNEL LIGHTING FIXTURE

Low-Cost, Accurate Main-Line Meters

The Sparling Main-Line Meter, made by R. W. Sparling, 945-951 North Main Street, Los Angeles, Calif., is accurate, loss of head through it is very low, and it requires no special protection against freezing. There are no delicate parts to keep in adjustment, and hot or dirty water does not hurt it. The only requisites are that the velocity of flow be at least the meter's rated minimum and that there be about eight pipe diameters of straight approach to the meter. The pipe must run full, but may be in any position from horizontal to vertical. Line pressures may range from minus 15 pounds per square inch to plus 150 pounds without impairing the accuracy of registration.

The construction of the meter permits installation on top, bottom or side of the pipe. For underground pipes a register extension should be used, bringing the meter face to the surface of the ground for easy reading. In installing one of these meters, it is necessary only to cut or burn a hole in the pipe, bolt on the saddle over the lead gasket, calk the lead to make a tight joint, place the cast iron cover plate, which carries the shaft housing, over the saddle and tighten up a few cap nuts. The meter is then ready for operation and in two minutes' time may be removed from the pipe for inspection.

Shaft, ball bearings, worm and gear are made of hard, stainless steel; shaft-housing register and dial case are of brass or bronze; and saddle and cover-plate are of cast iron. The absence of close-fitting parts and displacement chambers insures long, accurate and repair-free operation. The few wearing parts are enclosed and lubricated by Alemite connections. Practically the only wearing part is the front ball bearing, which may be replaced in ten minutes' time at low cost.

Where permanent pen-and-ink records are desired, the meter may be supplemented by a Sparling Rate-of-Flow Recorder or a Metrograph Recorder. These give concise, easily read charts showing actual operation day by day and hour by hour, and may be operated direct from the meter up to a distance of 15 feet by a flexible cable or to any desired distance by electrical control.

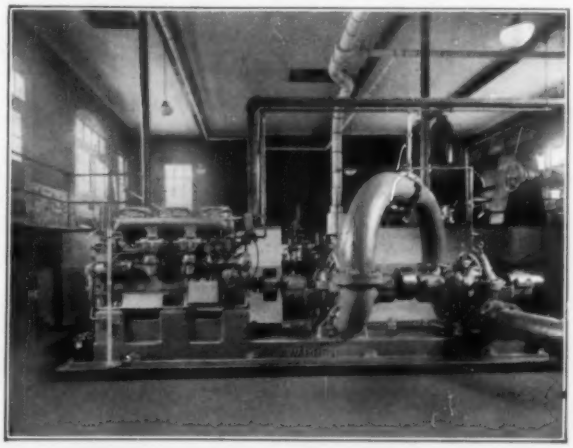
Measuring units on the Main-Line Meters and all accessories are varied to suit the customer's needs. They may be in gallons, cubic feet, acre-feet or pounds. Rate of flow may be shown in millions of gallons per day, gallons per minute, second-feet or thousands of pounds per hour.

Pittsburgh-Des Moines Moves New York Office

The Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa., has announced the removal of its New York office from 50 Church Street, to 270 Broadway. Howard W. Ford will continue in charge as District Sales Manager.

Booklet on High-Duty Gasoline Engines

The Sterling Engine Co., Buffalo, N.Y., has just issued a modernistic 12-page booklet, "What is the Difference?", describing Sterling high-duty gasoline engines and answering such questions as "Is the crankshaft counterweighted and dynamically balanced?"; "Are the main bearings fitted without shims?"; "Has the engine an oil cooler and filter?"; "How long is the engine tested?"; and others regarding the essential larger features of the engine. The booklet is illustrated throughout with drawings of the various parts discussed and photographs of installations of Sterling engines, such as that of the water works of Webster, Mass., reproduced here. The Sterling engine has long been known as a reliable standby unit for municipal power plants and water works. Copies of the booklet may be secured on request from the Sterling Engine Co.



STANDBY 6-CYLINDER STERLING INSTALLATION IN THE WEBSTER, MASS., WATER WORKS

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Rates and Physical Data for Street Lighting in New York Municipalities

ONE of the most extensive compilations of data of municipal interest recently prepared by the New York State Bureau of Municipal Information—the research agency of the New York State Conference of Mayors and Other Municipal Officials, with headquarters at Albany, N. Y.—is its Report No. 39, covering street-lighting rates and data for cities and villages of that state. Inasmuch as this presents a large amount of detail which, it is felt, will be of interest to municipalities, large and small, in other states, and as the Bureau's bulletins are not generally available outside the state, THE AMERICAN CITY has rearranged the data in convenient tabular form, expanding it in some instances from additional information received directly from the cities involved.

The division between cities and villages, while not strictly based on population, practically amounts to a grouping by size. The 46 cities reported range in population from New York (6,930,466) to Mechanicville (7,924); the 45 villages range from Port Chester (22,662) to Walden (4,283), most of them having between 5,000 and 10,000 inhabitants.

Wide variety is shown in the tables: lamp sizes range from 21,000 lumens down to 300 lumens (candlepower being expressed in lumens in the ratio of 1 to 10); post spacing for ornamental lighting, from 50 feet up to 600 feet, while for general lighting the lamps are from 75 to 800 feet apart; annual rates, from $7.30 for a 424-lumen unit to $160 for a 21,000-lumen unit. In most cases rates are on the basis of a fixed charge per lamp (or post) per year or other periods, although a few more complicated schedules are reported. The municipal plants do not report segregated rates for street lighting, except Jamestown.

Rates—Cities

(Rates are per lamp per year unless otherwise stated. Figures in parentheses after city names are 1930 population.)

ORNAMENTAL LIGHTING

Albany (127,412): 1,000-lumen, $31.025; 2,500-lumen, $45.625; 6,000-lumen, $73.

Amsterdam (34,817): 2,500-lumen, $75; 6,000-lumen, $110; 10,000-lumen, $106 (101 lamps), $136 (21 lamps).

Auburn (36,652): Cluster of 5 60-w. lamps (a. 3,330 lumens, total), $46; single 6,000-lumen, $115.*

Beacon (11,933): Ornamental and general—Main Street, 6,000-lumen, all night, $60, half night, $50; side streets underground system, 5,000-lumen, $80, 4,000-lumen, $70; other, 4,000-lumen, $50; 2,500-lumen, $42; 1,000-lumen, $28; 320-lumen, $18.

Binghamton (76,662): Ornamental—all night, 6,000-lumen, $82.50; 2 300-w. (a. 10,560 lumens, total), $95; 300-w. (a. 5,280 lumens), $75; 2 200-w. (a. 6,480 lumens, total), $86; 4 100-w. (a. 5,280 lumens), $82.50; dusk to midnight, 300-w., $60; 2 200-w., $68.50; 4 100-w., $65. General (all night)—6,000-lumen, $62.50; 4,000-lumen, $55; 2,500-lumen, $38; 1,000-lumen, $20.

Buffalo (573,076): Ornamental and general, Underground system: Standards furnished by city—inverted luminous arcs, 528-w., 6.6-amp. (16,700 lumens), $84; 320-w., 4-amp., $70; 10,000-lumen incandescent, $70; 6,000-lumen, $60; 4,000-lumen, $48; 2,500-lumen, $36; 1,500-lumen (residence), $32 (park), $30; 1,000-lumen, $28. Standards furnished by Main Street Association—inverted luminous arc (on triple-top standards), 528-w., 6.6-amp., 16,700-lumen, $75. Overhead system: Entire equipment owned by lighting company—magnetite pendent arcs, 320-w., 4-amp., $48; 6,000-lumen incandescent, $48; 4,000-lumen, $36 (24-hour), $60; 2,500-lumen, $25; 1,000-lumen, $17.

Cohoes (23,226): Rates not reported.

Corning (15,777): 4,000-lumen (to 11 p.m.), $26.50.

* This price includes amortization of installation cost in first 5 years.

Physical Data—Cities

ORNAMENTAL LIGHTING

City	Contract Expires	Lamps per Post	Lumens, Watts, Amperes	Post Spacing	Post Arrangement[1]	U. G. or O. H.[2]	Hours of Service	City Owns Street Lighting System?	Cost of Lighting Paid by[3]
Albany	1931	1, 2	2,500 l. 6,000 l.	120′	Both	U. G.	4,000, yr.	No	City
Amsterdam	1-1-32	1	2,500 l. 6,000 l. 10,000 l.	125′	Alt.	U. G.	11, nt.	No	City
Auburn		5 1	60 w. 6,000 l. 6.6 amp.	80′-100′	Alt.	U. G.	4,000, yr.	Conduits for 5-lt. clusters only	¾, S. A.; ¼, city
Beacon	[9]	1	6,000 l.		Opp.	O. H.	Some all nt., some ½ nt.	Yes	City
Binghamton	Jan. '33	1 2 3	6,000 l. 200 w. 100 w.	50′-150′	Both	Both		In older systems only	½, S. A.; ½, city
Buffalo	7-1-31	1 3 (ares)	1,500 l. {16,700 l. {6.6 amp. 4 amp.	110′ av.	Both	Both	4,000, yr.	Standards in U. G. system only	City
Cohoes		1, 2	6,000 l.	110′-115′	Alt.	U. G.	Varies	No	City
Corning	1932	1	4,000 l.	105′		U. G.	Dusk to 11	Post only	City
Dunkirk	[4]	1	6,000 l. 4,000 l.	150′	Both	U. G.	All night	Yes	City
Fulton	8-1-38	1	1,000-2,500-4,000-6,000 l.	100′	Opp.		All night	No	City
Glens Falls	July, '31	1	10,000 l.	85′	Alt.	U. G.	All night[10]	No	S. A.
Gloversville	3-1-33	1	10,000 l. 20 amp.	Varies	Alt.	Both	All night	Yes	S.A.; and City
Hudson	1932	1	2,500 -, 1,000 l						
Ithaca	11-1-38	1	6,000 l. 20 amp.	100′	Alt.	U. G.	10½ hrs., nt.	Posts and lamps only	City
Jamestown	[4]	1	2,500 to 10,000 l.		Opp.	U. G.	½ all night	Yes	City*
Kingston	10-1-30	1	6,000 & 10,000 l. 20 amp.	Varies	Opp.	O. H.	All night[10]	Special equipment only	City
Lackawanna		1	1,500 l. & 4-a arcs	100′	Alt.	Both	All night[7]	Standards only	City
Little Falls		1	6,000 l.	100′	Alt.	O. H.	10, nt.	Yes	City
Mechanicville	10-1-33	1	arcs	100′			All night	No	City
Middletown		1	4,000 l.	75′ av.	Alt.	U. G.	All night[9]	Yes	City
Mt. Vernon	Mar., '34	1	4,000 l.	100′ av.	Opp.	Both	4,050, yr.	No	City
New Rochelle	12-31-33	1, 2	4 & 6.6 amp. ares; also 6,000 l.	110′	Opp.				City
New York	12-31-31	1, 2	100 to 1,000 w.	100′-200′	2 at intersections	U. G.	4,050, yr.	Posts for 200-w. and smaller [14]	City
Newburgh	[3]	2 to 5	600 to 4,000 l.				To midnight		
Niagara Falls	1933	1, 2	4 & 6.6-amp. ares; also 6,000 l.	90′-120′	Opp.	O. H.	Approx. 13, nt.	Posts only	City

RATES (*Continued*)

Dunkirk (17,802): Municipal system, ornamental lighting cost not segregated; see under rates for general street lighting.

Fulton (12,462): Ornamental and general. Center-span, 6,000-lumen, $52; 4,000-lumen, $43. Mast-arm, 6,000-lumen, $48; 4,000-lumen, $40; 2,500-lumen, $30; 1,000-lumen, $22.

Geneva (16,053): 6,000-lumen, $108.84; 2,500-lumen, $54; 1,000-lumen, $32.

Gloversville (23,099): 10,000-lumen, $61.50.

Hudson (12,337): Ornamental and general—1,000-lumen, $35; 2,500-lumen (with radial wave reflector) $50, (in Novalux Eternalite unit) $55, (ornamental pole type) $55, (in Novalux highway unit) $57; 4,000-lumen, $62.50; 6,000-lumen, $75; 10,000-lumen, $100.

Ithaca (20,708): 6,000-lumen, $69; 2,500-lumen, $41.50.

Jamestown (45,155): 10,000-lumen, $54; 6,000-lumen, $39; 4,000-lumen, $28; 2,500-lumen, $18; 10,000-lumen to midnight only, $33.

Kingston (28,088): 10,000-lumen, $66; 6,000-lumen, $48.

Lackawanna (23,948): $37.50, $50, $75.

Little Falls (11,105): 6,000-lumen, $70; 5,000-lumen, $65.

Mechanicville (7,924): See general lighting.

Middletown (21,276): See general lighting.

Mt. Vernon (61,499): 4,000-lumen, $100.

New Rochelle (54,000): Overhead system, 4,000-lumen, $100; 2,500-lumen, $60; 1,000-lumen, $30.

New York (6,930,466): One lamp per post, 100-w. (a. 1,320-lumen), $25; 200-w. (a. 3,240-l), $45; 300w., (a. 5,28-l.), $74; 400-w. (a. 7,880-l.), $87; 500-w. (a. 9,500-l.), $97; 750-w. (a. 14,-775-l), $127; 1,000-w. (a. 21,000-l), $160. Two lamps per post, per pair, 200-w., $82; 300-w., $120; 400-w., $150; 500-w., $169; 750-w., $225.

LIGHTING UNIT ON RIVERSIDE DRIVE VIADUCT, NEW YORK CITY

This type is used on various viaducts and stairways. There are 35 of them at this location, spaced 90 feet apart longitudinally, and 97 feet across the viaduct between opposite units. Each Westinghouse lantern contains a 200-watt lamp (3,240 lumens) and an upper and lower reflector, and is 15 feet above the roadway. The standards were specially cast to city's specifications

Newburgh (31,275): Rates not reported.

Niagara Falls (75,460): 4-amp. arc, $50; 6.6-amp. arc, $75; 6,000-lumen incandescent (Novalux), $45.

North Tonawanda (19,019): 6,000-lumen, $70; 2,500-lumen, $55; 1,500-lumen, $50.

Ogdensburg (16,915): Cluster of 5 60-w. lamps (a. 3,330 lumens, total), $62; 4 lamps, $57.

Olean (21,790): 2,500-lumen, $55; 4,000-lumen, $70; 10,000-lumen, $100; cluster of 4 60-w. (a. 2,664 lumens, total), $45; single 60-w. (a. 666-lumen), round globe, $18; 2,500-lumen on ornamental brackets, wood pole, $40.

Oneida (10,558): 6,000-lumen, $75.

Oneonta (12,536): Ornamental, $65 to $90; overhead system, $25 to $72.

Oswego (22,652): 4,000-lumen, $48.40.

Plattsburg (13,349): 6,000-lumen, $97.

PHYSICAL DATA (*Continued*)

City	Contract Expires	Lamps per Post	Lumens, Watts, Amperes	Post Spacing	Post Arrangement[1]	U. G. or O. H.[2]	Hours of Service	City Owns Street Lighting System?	Cost of Lighting Paid by[4]
No. Tonawanda		1	6,000 l.	85′-245′	Opp.	U. G.	All night	No	City
Ogdensburg		4, 5	60 w.	65′-70′	Opp.	U. G.	4,000, yr.	No	City
Olean	1935	1	4,000-6,000 l.	100′	Both	U. G.	All night	No.	City
Oneida		1	6,000 l. 6.6 amp.	100′-125′	Alt.	U. C.	12, nt.	No	½, S. A.; ½, city
Oneonta	1-1-39	1	1,000-4,000-6,000 l.	100′	Alt.	Both	All night[9]	No	City
Oswego	Mar., '35	1	4,000 l.	100′	Opp.	O. H.	10-12, nt.	Yes	City
Plattsburg	2-11-37	1	6,000 l		Alt.	U. G.	All night	No	City
Port Jervis		1	400 w. 15 amp.	150′	Alt.	U. G.	All night	Yes	City
Poughkeepsie		1		100′-105′	Opp.	U. G.		Posts only	City
Rensselaer	10-1-35	1	2,500 l.	a. 150′	Alt.	U. G.	a. 13, nt.	No	City
Rochester		2	6.6 amp. arcs & 10,000 l.	39′-120′	Alt.	U. G.	4,000 yr.	No	Part S. A.; part city
Salamanca	[6]	1	2,500-10,000 l.	100′-125′	Alt.	Both	11, nt., av.	Yes	City
Saratoga	May, '32	2	2,500 & 10,000 l. 6.6 amp. arcs	200′	Opp.	U. G.	All night[11]	No	City
Schenectady	1934								
Syracuse	7-1-32	1 & 2	1,000-2,500-4,000-6,000-10,000-15,000 l. & arcs	115′ & 85.6′	Alt.	U. G.	4,000,yr.	No	½, S. A.; ½, city
Tonawanda	1931	1	800-6,000 l.	90′-180′	Both	Both	11, nt., av.	No	City
Troy		1	2,500 l. 6,000 l.	125′-150′	Alt.	U. G.	4,000, yr.	No	½, S. A.; ½, city
Utica	12-31-31	1	1,000-2,500-4,000-6,000-10,000 l.	25′-600′[13]	Alt.	U. G.	All night[9]	Some conduits only	City
Watertown	[6]	1	4,000 l. 6.6 amp.	90′ av.	Alt.	U. G.	4,100, yr.	Yes	City
White Plains	6-2-32	1	600-4,000 l.	100′-200′	Both	Both	All night	No	City
Yonkers		5	6,000-10,000 l.	100′	Alt.	U. G.	[14]	Yes	City

Nt.-night; yr.-year; a.-about [1] Opposite, alternate (staggered), or both. [2] Underground or overhead distribution. [4] Renewal automatically. [6] Municipal plant. [9] S. A., special assessment on benefited property; City, city as a whole. [6] Abutting property owners pay for installation. [7] 5 p. m. to 7 a. m. in winter. [8] Half-hour before sunset to half-hour after sunrise. [9] Half-hour after sunset to half-hour before sunrise. [10] Half-hour before sunset to half-hour before sunrise. [11] One hour after sunset to one hour before sunrise. [12] 11 hours per night for 1 lamp, 7 hours for other 4. [13] 25 to 200 feet in business section, 200 to 600 feet in residence section. [14] City also furnishes posts for some 309-w. and 400-w. lamps; lighting company generally furnishes the posts for 300-w. and larger.

THE PLAZA, YONKERS, N. Y., SHOWING IMPROVED LIGHTING

The open approach to the railroad station, with the Hudson River and the Palisades beyond, which replaced an unsightly district of years ago, is lighted by 32 Union Metal standards carrying twin Novalux lanterns. Three standards have 400-watt lamps, giving 14,800 lumens per standard; the others have two 300-watt lamps each (10,800 lumens per standard). Lamps are 18 feet 4 inches above the pavement; spacing is from 62 to 107 feet

GENERAL LIGHTING

City	Term of Contract, Years	Lamps per Pole	Lumens, Watts, Amperes	Spacing, Feet	Arrangement on Street[1]	O. H. or U. G.[2]	Hours of Service	City Owns St.-Ltng. System?	Cost of Lighting Paid by[3]
Albany		1	6,000 l.	125-350	Both	Both	4,000, yr.	No	City
Amsterdam	5	1	800-2,500-6,000 l.	500, av.	Alt., mostly	O. H.	11, nt., av.	No	City
Auburn				275-500		O. H.	4,000, yr.	No	City
Beacon						Both	All night	No	City
Binghamton	5	1	1,000 l. I. 4,000 l., A.						½ S. A., ½ city
Buffalo	1	1	4,000 l.	125, av.		O. H.	4,000, yr.	No	City
Cohoes		1	6,000 L., A.						
Corning		1	1,000 & 6,000 l.						

RATES (*Continued*)

Port Jervis (10,243): 400-w., (a. 7,880 lumen), $47.50.

Poughkeepsie (40,288): 6,000-lumen, $85; 4,000-lumen, $70; 2,500-lumen, $60; 1,000-lumen, $45; 1,000-lumen, goose-neck, overhead system, $28; 4 300-lumen (cluster), $60.

Rensselaer (11,223): Annual facility charge per 100 feet of circuit—overhead, old joint circuits, $4, new street-lighting circuits, $8; underground, in parkway, $30; in duct line in street, or in conduit in concrete back of curb, $45; in conduit under asphalt, or concrete filled block pavement, $80; plus fixture charge, for Novalux eternalite, pendant on bracket or 12-foot metal pole, $17; Form 32, pendant on bracket or 14-, 16-, or 18-foot pole, $20; plus lamp charge, 800-lumen, $8.50; 1,000-lumen, $10; 2,500-lumen, $28; 4,000-lumen, $36; 6,000-lumen, $46; 10,000-lumen, $70; 15,000-lumen, $101 (Less $9 for 2,500-, 4,000- or 6,000-lumen lamps without Type IL transformers).

Rochester (328,132): Underground system—6,000-lumen incandescent, 300 ft.,[1] single, $68, double, $62.95 each; 520-w. arc, single, 150 ft.,[1] $91.25, double, $90 each; 10,000-lumen incandescent, 200 ft.[1] $80.30; 4,000-lumen, 115 ft.,[2] $54.08; 2,500-lumen, 100 ft.[1] $43.03; 2,000-lumen, 80 ft.,[1] $32, 100 ft.,[2] $34.25; 800-lumen, 50 ft.,[1] $22.63, 80 ft.,[1] $24.88 (24 hours per day). Overhead system—6,000-lumen incandescent, 300 ft.,[1] single, $57.95; 4,000-lumen, 250 ft.,[1] $43.20; 2,500-lumen, 250 ft.,[1] $28; 2,000 lumen, 250 ft.,[1] $24; 800-lumen, 80 ft.,[1] $18.

[1]Maximum spacing.

Salamanca (9,577): Municipal system; no segregated rates; average cost for all lamps, $17.50.

Saratoga (13,169): $150 per post of 2 lamps.

Schenectady (95,692): Practically same as Rensselaer, with following additional rates: Fixture charges, 4-amp. pendent arc on mast arm, $66; 6.6-amp. single luminous arc unit on 14-, 16-, or 18-foot metal pole, $111.30; 6.6-amp. twin arc unit on 20-foot metal pole, $217; same to midnight only, $193 (these fixture charges for arcs include the lamp charge); Novalux highway unit, 30-foot mounting $20, bracket and radial wave reflector $6 extra; Form 25 pendent unit, $17; Form 6 pendent unit, $20; special 11-foot concrete poles, $10; 6.6-amp. arc bracket lamps, $86.

Syracuse (209,326): 2,500-lumen, $45.50; 4,000-lumen, $65; 6,000-lumen, $75; 10,000-lumen, $85; 15,000-lumen, $105; luminous arcs, single, $90, double, $165 per pair.

Tonawanda (12,681): Underground system—6,000-lumen, $70; 1,500-lumen, $30, $37.50 and $50; 800-lumen, $17.50. Overhead system—6,000-lumen, $47.50 and $60.

Troy (72,763): 6,000-lumen, $80.30 and $94.90; 2,500-lumen, $65.70; 6,000-lumen, to 1 a.m., $65.70.

Utica (101,740):

Spacing Feet	10,000	6,000	4,000	2,500
		Lumens		
		Business Section		
25.....	$112.75	$89.00	$73.00	$58.75
50.....	121.50	98.00	82.00	67.50
75.....	130.25	107.00	90.75	76.50
100.....	139.25	116.00	99.50	85.25
125.....	147.75	224.75	108.25	94.00
150.....	156.75	133.50	117.75	103.50
175.....	166.25	142.50	126.50	112.25
200.....	176.00	151.25	135.50	121.00
		Residence Section		
200.....	133.00	109.50	93.50	79.00
300.....	147.50	128.75	107.75	93.50
400.....	161.75	138.50	122.00	107.75
500.....	176.00	153.00	136.50	122.00
600.....	190.75	167.25	151.25	137.00

Watertown (32,205): Municipal plant. No rates reported.

White Plains (35,830): 1,000-lumen, $30; 2,500-lumen, $60; 4,000-lumen, $100.

Yonkers (134,646.: 1 300-watt (a. 5,280-lumen), all night, and 1 200-watt (a. 3,340-l.), to midnight, $102; 1 400-w. (a. 7,880-l.), all night, and 1 400-w., to midnight, $150; 1 200-w., all night, and 1 200-w., to midnight, $91.50; 2 400-w., all night, $170; 2 300-w., $130; 400-w., all night, $100; 300-w., $85; 200-w., $65; 100-w., $35; 60-w., $24; 5 60-w. (a. 3,330-l., total), $88; 500-w. floodlight to midnight, $85; 250-w. floodlight, all night, $75, to midnight, $50.

GENERAL LIGHTING

Amsterdam: 800-lumen, $30; 2,500-lumen, $50; 6,000-lumen, $75.

PHYSICAL DATA (*Continued*)

City	Term of Contract, Years	Lamps per Pole	Lumens, Watts, Amperes	Spacing, Feet	Arrangement on Street[1]	O. H. or U. G.[2]	Hours of Service	City Owns St.-Ltng. System?	Cost of Lighting Paid by[3]
Dunkirk[4]		1	1,000–4,000 w.			O. H.	All night	Yes	City
Fulton		1	1,000–2,500–4,000 l.				All night	No	City
Geneva	5	1	1,000 l.	280		O. H.	All night	Some	
Gloversville	10		600 & 6,000 l.	Varies	Alt.	O.H.	All night[5]	No	City
Hornell	2	1	1,000–2,500 l.	Varies	Alt.		All night		City
Hudson	5	2		Varies	Alt.				City
Ithaca	10	1	1,000–6,000 l.			O. H.	3,900, yr.	No	City
Jamestown[4]		1	10,000–6,000–4,000–800 l.			O. H.	All night	Yes	City
Glens Falls		1	6,000 l.						
Kingston	1	1	1,000–600 l.	Varies		O. H.	All night	Poles only	City
Lackawanna		1	4,000 l.			Both	7 & 14[5]	No	City
Little Falls		1	2,500&1,000 l.	250	Alt.	O. H.	All night	No	City
Mechanicville	3			100	At corners	Both	All night	No	City
Middletown			1,000–2,000 l.	Varies	One side	O. H.	All night	No	City
Mt. Vernon	5	1		120	One side	O. H.	4,050, yr.	No	City
New Rochelle		1	1,000 l.			O. H.	4,050, yr.	No	
New York	1	1	1,000–2,500–4,000–6,000 l.	100–240	One side	O. H.	4,050, yr.	No	City
Niagara Falls	5	1	200–500 w. I. & A.	100	Opp.	U. G.	9 & 14[5]	No	City
No. Tonawanda	3	1	6,000–2,500–800 l.	300	One side	O. H.	All night	No	City
Ogdensburg		1	600 & 6,000 l.	450	At corners	O. H.	4,000, yr.	No	City
Olean	10	1–4	600–10,000 l., A.	Varies	Varies	Both	All night	No	City
Oneida		1	1,000–2,500 l.	500	One side	O. H.	12, nt.	No	City
Oswego	5	1	2,500–10,000 l.	200	[8]	O. H.	8-12, nt.	No	City
Plattsburg	10	1	1,000–2,500 l.	Varies		O. H.	All night[6]	No	City
Port Jervis	5	1	600–1,000–2,500–4,000 l.	Varies	Alt.		All night	No	City
Poughkeepsie	[9]	1	800 & 6,000 l.	a. 250	Both		4,000 yr.	No	City
Rensselaer	5	1	800-2,500 l.	75–150	Both	O. H.	a. 13	No	City
Salamanca[4]		1	350-w. A.	135	Alt.	O. H.	a. 11	Yes	City
Saratoga	5	1		200	One side		All night;	No	City
Schenectady			6 6-amp. A.			U. G.	All night	No	
Syracuse	5	1	2,500–4,000 l.	100	One side	O. H.	4,000, yr.	No	City
Tonawanda	5	1	800 & 6,000 l.	150–300		O. H.	11, nt.	No	City
Troy		1	6,000 l.	400	Both	O. H.	a. 4,000, yr.	No	City
Utica	5	1	2,500 l.	Varies	Alt.	U. G.	All night	No	City
Watertown[4]		1	4,000 l.	125 av.	One side	O. H.	4,100, yr.	Yes	City
White Plains	3	1	600–4,000 l.	100–200	Both		All night	No	City
Yonkers		1	4,000–6,000–10,000 l.						

A.- arc; I.- incandescent.

[1] Opposite, alternate (staggered), or both. [2] Overhead or underground distribution. [3] S. A., special assessment. [4] Municipal plant. [5] Summer and winter nights, respectively. [6] Half-hour before sunset to half-hour after sunrise. [7] One hour after sunset to one hour before sunrise. [8] On corner and in center of block. [9] Automatic renewal each year.

Auburn: 1,000-lumen, $27; 2,500-lumen, $45; 4,000-lumen, $55; 6,000-lumen, $63.50.

Corning: 6,000-lumen, O.H., $70; 4,000-lumen, O.H., $52.80; 1,000-lumen, mast-arm, $28; 1,000-lumen, gooseneck, $26.

Dunkirk: Municipal system, no segregated rates; average cost, $21.02.

Geneva: 1,000-lumen, $27.

Gloversville: 6,000-lumen, $60; 600-l., $16.50.

Hornell: 1,000-lumen, $28; 2,500-lumen, $42.

Ithaca: 1,000-lumen, $23; 2,500-lumen, $40; 4,000-lumen, $60; 6,000-lumen, $71.

Jamestown: 10,000-lumen, $63; 6,000-lumen $45; 4,000-lumen, $33; 2,500-lumen, $21; 800-lumen, $15.

Kingston: 2,500-lumen, $30; 1,000-lumen, $18; 600-lumen, $12.50.

Little Falls: 2,500-lumen, $46.50; 1,000-l., $30.

Mechanicville: $60.65 and $75.

Middletown: 600-lumen, $18; 1,000-lumen, $24; 2,500-lumen, $40; 4,000-lumen, $57.50.

Mt. Vernon: 2,500-lumen, $60; 1,000-l., $30.

New Rochelle: 1,000-lumen, $30.

New York: 1,000-lumen, $23; 2,500-lumen, $46.75; 4,000-lumen, $75; 6,000-lumen, $87.

Niagara Falls: 5c per kwh. for first 60 hrs., 4c for next 120 hrs., 1½c for remainder.

North Tonawanda: 6,000-lumen, mast-arm type, $47.50; 800-lumen, bracket, $17.50; 2,500-lumen, highway, $55.

Ogdensburg: 6,000-lumen, $65; 600-lumen, $23.

Olean: 600-lumen, $18; 1,000-lumen, $28; 2,500-lumen, $35; arcs, $60.

Oneida: 2,500-lumen, $50; 1,000-lumen, $35.

Oswego: 2,500-lumen, $31.32; 4,000-lumen, $48.36; 6,000-lumen, $66; 10,000-lumen, $76.92.

Plattsburg: 2,550-lumen, $55; 1,000-l., $33.75.

Port Jervis: 4,000-lumen, $57.50; 2,500-lumen, $40; 1,000-lumen, $24; 600-lumen, $18.

Poughkeepsie: 800-lumen, $25; in 4-light cluster, $48; 1,000-lumen, $30; 2,500-lumen, $42; on ornamental bracket, $37; 6,000-lumen, $60; on ornamental bracket, $55.

Saratoga: 6,000-lumen, $75; 4,000-lumen, $62.50; 2,500-lumen, $50; 1,000-lumen, $35; 800-lumen, $30; 600-lumen, $25.

Syracuse: 2,500-lumen, $30; 4,000-l., $37.50

Troy: 6,000-lumen, $73; 1,000-lumen, $36.50; 600-lumen, $27.375 and $21.90.

White Plains: 4,000-lumen, $100; 2,500-lumen, $60; 1,000-lumen, $30.

Yonkers: 4,000-lumen, $75; 2,500-lumen, $60; 1,000-lumen, $27.50.

Beacon, Binghamton, Buffalo, Lackawanna, Rensselaer, Salamanca: See ornamental lighting.

High-Intensity Floodlight

HUGE UNIT FOR AIRPORT ILLUMINATION

This Sperry-AGA landing-field floodlight, with a maximum beam candlepower of 4,000,000 and a spread of 180°, is at the Glenn H. Curtiss Airport, established a short time ago in the Borough of Queens, New York City. It is not exceeded in intensity elsewhere, and is equalled at few other airports

Rates and Physical Data for Street Lighting in Villages of New York State

Rates

ORNAMENTAL LIGHTING

Albion (4,878): *Arcs*, $62; side lights, $48.
Bronxville (6,387): 4,000-lumen, $125; 2,500-l., $85; 1,000-l., $45.
Catskill (5,082): 6,000-l., $85.
Cedarhurst (5,065): $90.
Depew (6,536): 4,000-l., $75; 2,500-l., $45.
Dobbs Ferry (5,741): 4,000-l., $125; 2,500-l., $60; 1,000-l., $30.
East Rochester (6,627): 4,000-l., $54.08; 2,500-l., $43; 2,000-l., $34.25.
Elmira Heights (5,061): 4,000-l., $50.
Endicott (16,231): 2,500-l., $38; 1,000-l., $21.50; 600-l., $30; 400-l., $16.50.
Floral Park (10,016): 6,000-l., $115; 1,000-l., $46.50.
Fredonia (5,814): See general lighting.
Freeport (15,467): Municipal.
Garden City (7,180): Rates not reported.
Hastings (7,097): 4,000-l., $100; 2,500-l., $60; 1,000 and 600-l., $30.
Haverstraw (5,621): 4,000-l., $58.25; 2,500-l., $56-$57; 1,000-l., $31-$33; 600-l., $24-$25.75.
Herkimer (10,446): No charge; municipal plant.
Hudson Falls (6,449): 10,000-l., $135; 6,000-l., $110.
Ilion (9,890): Rates not reported.
Johnson City (13,567): 6,000-l., $82.50; 2,500-l., $62.50.
Kenmore (16,482): 4,000-l., $52.25; 1,500-l., $38.
Lancaster (7,040): U. G. service, 4,000-l., $75; 2,500-l., $45.
Larchmont (5,282): 1,000-l., $30.
Lynbrook (11,993): 10,000-l., $112.50; 6,000-l., $90; 4,000-l., $77; 2,500-l., $50; 1,000-l., $25; 600-l., $19.80.
Malone (8,657): Rates not reported.
Medina (6,071): 4,000-l., $65; 2,500-l., $29.
Mineola (8,155): 6,000-l., $90; 600-l., $20.
Mt. Kisco (5,127): 4,000-l., $100; 2,500-l., $60; 1,000-l., $30.
Newark (7,649): 4,000-l., $42.60; 2,500-l., $28; 1,000-l., $12; 800-l., $10.32; 60w. (714-l.), $10.50; 40-w. (424-l.), $7.30.
Ossining (15,241): 4,000-l., $100; 2,500-l., $85, $60; 1,000-l., $30.
Patchogue (6,860): 6,000-l., $125, on ornamental pole, $95 on wood pole.
Peekskill (17,125): Rates not reported.
Penn Yan (5,329): Metered, $0.0361 per kwh.
Port Chester (22,662): 4,000-l., $125.
Rockville Centre (13,718): Municipal plant; average cost, all street lamps, including depreciation, $18.35.
Rye (8,712): 4,000-l., $100.
Saranac Lake (8,020): 6,000-l., $94.80; 4,000-l., $55; 1,000-l., $24; 600-l., $17.52.
Scarsdale (9,690): 4,000-l., $125; 2,500-l., $85.
Scotia (7,437): 6,000-l., $88.
Seneca Falls (6,443): Rates not reported.
Solvay (7,985): No charge; municipal plant.
Tarrytown (6,841): Rates not reported.
Tupper Lake (5,271): 4,000-l., $29; 2,500-l., $24.50.
Valley Stream (11,790): 6,000-l., $90; 4,000-l., $77; 2,500-l., $50; 1,000-l., $25.
Walden (4,282): Rates not reported.
Waverly (5,662): Rates not reported.

GENERAL LIGHTING

Bronxville: 2,500-l., $60; 1,000-l., $30.
Catskill: 10,000-l., $80; 4,000-l., $50; 1,000-l., $30.
Cedarhurst: 2,500-l., $50; 1,000-l., $25.
Elmira Heights: 6,000-l., $57; 2,500-l., $40.50; 1,000-l., $29.
East Rochester: 4,000-l., $43.20; 2,500-l., $28; 2,000-l., $42; 800-l., $28, $24.
Floral Park: 600-l., $20.
Fredonia: $22.50.
Hudson Falls: 4,000-l., $62.50; 2,500-l., $50; 1,000-l., $35; 600-l., $25.
Johnson City: 100-w. (a. 1,400-l.), $34; 1,000-l., $20.
Medina: 6,000-l., $62.
Mineola: 6,000-l., $90; 600-l., $20.
Newark: 800-l., $20.64.
Patchogue: 6,000-l., $25; 4,000-l., $24.
Port Chester: 1,000-l., $30.
Rye: 500-l., $60; 1,000-l., $30.
Scarsdale: 1,000-l., $30.
Scotia: 2,500-l., $50; 1,000-l., $35; 800-l., $30; 600-l., $25; 400-l., $22.50.
Endicott, Haverstraw, Lynbrook, Rockville Centre: Same as for ornamental.

Physical Data

ORNAMENTAL LIGHTING

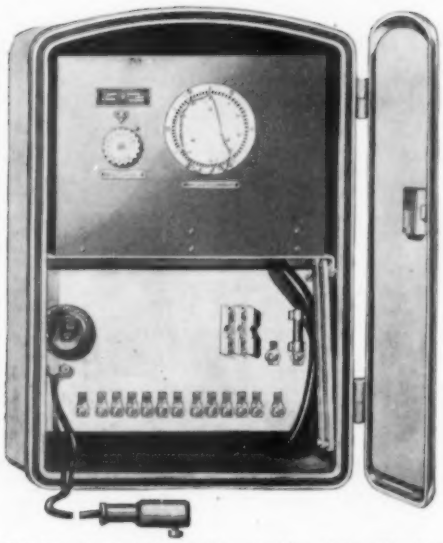
Name of Village	Contract Expires	Lamps per Post	Lumens, Watts, Amperes	Post Spacing, Feet	Post Arrangement[1]	U. G. or O. H.[2]	Hours of Service	Village Street Lighting System?	Owns Lighting	Cost of Lighting Paid by[3]
Albion	.....	1, A	2,500 l.	a. 140	Alt.	Both	All nt.	No		Village
Bronxville	1934	1 & 2	1,000-2,500-4,000 l.	a. 100	Both	U. G.	12, nt.	No		Village
Catskill	1931	1	6,000 l.	a. 100	Alt.	U. G.		Yes		Village
Cedarhurst	.....	1	6,000 l.	a. 150	Alt.	U. G.	10, 6073, nt.	Yes		Village
Depew	1932	1	2,500-4,000 l.			O. H.	12, nt.	No		Village
Dobbs Ferry	.....	1	2,500 l.	a. 50	Alt.	O. H.	All nt.	No		Village
E. Rochester		1	2,000-2,500-4,000 l.		Alt.[5]	U. G.	10, nt.	No		Village
Elmira Heights		1	4,000 l.	100	Opp.	O. H.	All nt.[5]	Yes		Village
Endicott[4]	1932	1, 2, 4	1,000-2,500 l. 75-200 w.	85–125	Both	Both	All nt.	Yes		Village
Floral Park	1934	1	1,000&6,000 l.		1 side[6]	Both	12, nt.	No		Village
Freeport[4]		1–3	6,000 l.		Both	Both	All nt.[6]	Yes		
Garden City	1934	1	800-4,000 l.	270–300	1 side[6]	U. G.	All nt.	No		Village
Hastings	1934	1		120	1 side[6]	O. H.		No		Village
Haverstraw	1939	1	4,000 l.	150	Alt.	U. G.	All nt.[7]	Yes		Village
Herkimer[4]		1	4,000-10,000 l.	90–175	Alt.	U. G.	All nt.	Yes		S. A. 2/3, Village 1/3
Hudson Falls	1938	1	1,000-6,000 l.	116	Alt.	U. G.	11, nt.	No		Village
Ilion[4]		1	4,000-6,000 l.	100–200	Both[10]	U. G.	6	Yes		E.
Johnson City	1934	1	2,500 & 6,000 l.	125–160	Opp.	Both	All nt.	Yes		Village
Kenmore	1937	1	1,500 & 4,000 l. 6.6 amp.	100	Alt.	U. G.	4,000, yr.	Posts		Village
Lancaster	1932	1	2,500-4,000 l.	125	Both	U. G.		Posts		Village
Larchmont	1934	1	1,000 l.	100	1/3 Opp., 2/3 Alt.	Both		No		Village
Lynbrook		1	600-4,000 l.	100	Alt.	U. G.	10, av.	Yes		Village
Malone	1932	1	4,000 l.			O. H.		No		
Medina	1934	1	2,500-4,000 l.	90–200	Alt.	U. G.	4,000, yr.	No		Village
Mineola	1935	1	60 & 600 w.	80, bus., 200, res.	Alt.	O. H.	All nt.	No		Village
Mount Kisco	1934	1		100	Both	O. H.	All nt.	No		Village
Newark		1	1,000-4,000 l. 40-60 w.	120	Both	O. H.	All nt.	Yes		Village
Ossining	1932	1	300-1,000-2,500-4,000 l.	120	1 side	Both	4,050, yr.	No		Village
Patchogue	1939	5	6,000 l.		Alt.	Both	All nt.[11]	No		Village
Peekskill		1	2,500-4,000 l.			O. H.	All nt.	No		
Penn Yan[4]		5	50-60 w.							
Port Chester		1	4,000 l.	100	Opp. [9]	O. H.	4,050, yr.	No		Village
Rockville Center[4]		1–5	1,000-10,000 l.	100–180	Alt.	U. G.	4,000, yr.	Yes		E.
Rye	1934	1	4,000 l.	150–200	[10]	O. H.	All nt.	No		Village
Saranac Lake	1936	1	1,000 l.	250	Alt.	Both	4,000, yr.	No		Village
Scarsdale	1935	1	2,500-4,000 l.	100	1 side	U. G.	10-12, nt.	No		Village
Scotia	1932	1	6,000 l.	100–200	Alt.	Both	All nt.	No		Village
Seneca Falls	1933	1	1,000-6,000 l.	200	Alt.	U. G.	9-12, nt.	No		Village
Solvay[4]		1	1,000-4,000 l.	125	Opp.	O. H.	a. 12, nt.	Yes		E.
Tarrytown		1–4	2,500 l.			O. H.	All nt.	No		
Tupper Lake[4]		1	2,500-4,000 l.	70	Alt.	Both	All nt.	Yes		E.
Valley Stream		1	1,000-6,000 l.	100–200	1 side	O. H.		No		Village
Walden	1940	1	2,500-10,000 l.	120	1 side		All nt.[7]	No		Village
Waverly	1932	1	6,000 l.			U. G.	All nt.	Yes		

A., arc.; a., about.
[1] Opposite, alternate (staggered) or both. [2] Underground or overhead distribution. [3] S. A., special assessment on benefited property; E., from earnings of municipal plant; or village as a whole. [4] Municipal plant. [5] 5 P.M. to 7 A.M. in winter; 7 P.M. to 6 A.M. in summer. [6] 13 hours in winter, 8 hours in summer. [7] ½ hour after sunset to ½ hour before sunrise. [8] One half, all night; other half, to midnight. [9] Mostly. [10] Opposite in business section; alternate in residential. [11] ½ hour before sunset to ½ hour after sunrise. [12] At street intersections.

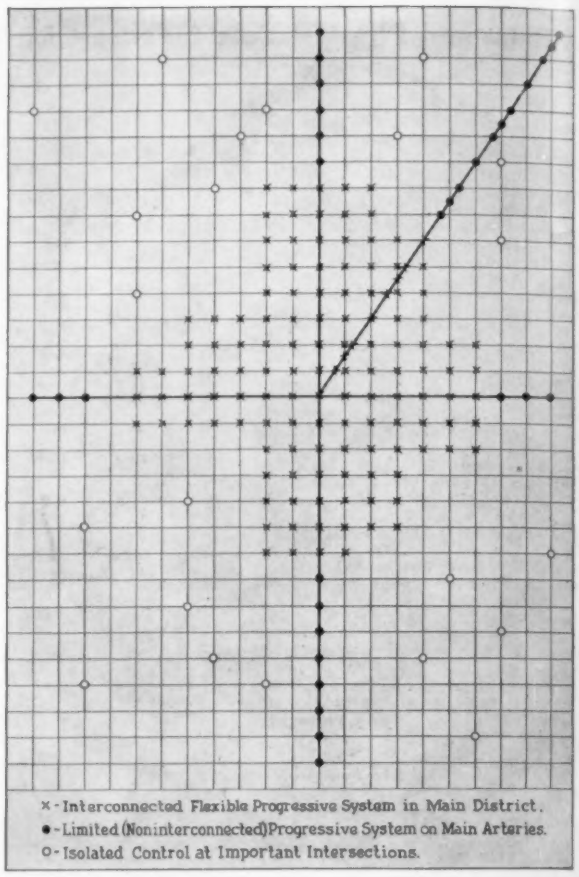
GENERAL LIGHTING

Name of Village	Term of Contract, Years	Lamps per Pole	Lumens, Watts, Amperes	Spacing, Feet	Arrangement[1]	O. H. or U. G.[2]	Hours of Service	Village Street Lighting System?	Owns Lighting	Cost of Lighting Paid by[3]
Bronxville		1	1,000 & 2,500 l.	75	1 side	O. H.	12, nt.	No		Village
Catskill	1	1	4,000 & 10,000 l.		Both	O. H.	All nt.	No		Village
Cedarhurst		1	1,000-2,500 l.	100	1 side	O. H.	10, 6073, nt.	No		Village
Dobbs Ferry	5	1	600-1,000-4,000 l.		Opp.[8]	O. H.		No		Village
E. Rochester	1	1	800-2,000-2,500-4,000 l.	150–300	Alt.	O. H.	10, nt.	No		Village
Elmira Heights		1	1,000-6,000 l.	500–800	Center		All nt.[5]			Village
Endicott	5	1	6.6 amp.							
Floral Park		1	600 l.	100–200	1 side	O. H.	12, nt.	No		Village
Fredonia	5	1	400 w.	100–125	Mast arms	O. H.	All nt.	Yes		Village
Freeport[4]		1	6.6 & 20 amp.							
Hastings	5	1	600-1,000-2,500-4,000 l.			O. H.	All nt.	No		Village
Haverstraw	10	1	600-1,000-2,500-4,000 l.		1 side	O. H.	All nt.[7]	No		Village
Herkimer[4]				125	1 side	O. H.	All nt.	Yes		E.
Hudson Falls	10	1, A.	2,500-4,000 l.	240–330	Center	O. H.	11, nt.	No		Village
Ilion[4]				125–250–300	1 side	O. H.	All nt.	Yes		E.
Johnson City	5	1	1,000 l.	a. 300	1 side	O. H.	All nt.	No		Village
Lancaster	5	1	2,500 & 4,000 l.	150–500	Both	O. H.	4,000, yr.	No		Village
Lynbrook		1		100	1 side	O. H.	Av. 10, nt.	No		Village
Malone		1	600-2,500 l.							
Medina	5	1	6,000 l.	[12]		O. H.	4,000, yr.	No		Village
Mineola	5	1	600-4,000 l.	200–300	Alt.	O. H.	All nt.	No		Village
Newark	5	1	800 l.	120	1 side	O. H.	4,000, yr.	No		Village
Ossining		1		120	1 side		4,050, yr.			Village
Patchogue	10		6,000 l.		Both		All nt.[11]			Village
Penn Yan[4]		1, A		500–600		O. H.	All nt.	Yes		Village
Port Chester	5	1	1,000 l.	250	Alt.	O. H.	4,050, yr.	No		Village
Rockville Center[4]		1	600 -1,000 -2,500 l.	Av. 120	1 side	O. H.	4,000, yr.			E.
Rye	5	1	1,000 & 2,500 l.	150–200	Alt.	O. H.	All nt.	No		Village
Saranac Lake	10	1	600 & 4,000 l.	a. 250		Both	All nt.	No		Village
Scarsdale	5	1	1,000-4,000 l.	a. 200	1 side	O. H.	10-12, nt.	No		Village
Scotia	5	1	400-2,500 l.	100–200	Alt.	O. H.		No		Village
Seneca Falls		1		200	Alt.	O. H.	9-12, nt.	No		Village
Solvay[4]		1	1,000-2,500-4,000 l.	125	In line	O. H.	12, nt.	Yes		E.
Tarrytown		1	320-2,500 l.							
Tupper Lake[4]		1	2,500 & 4,000 l.	70	Alt.	Both	All nt.	Ye		E.
Waverly		1	1,000 l.							

A., arc.; a., about.
[1] Opposite, alternate (staggered) or both. [2] Underground or overhead distribution. [3] S. A., special assessment on benefited property; E., from earnings of municipal plant; or village as a whole. [4] Municipal plant. [5] 5 P.M. to 7 A.M. in winter; 7 P.M. to 6 A.M. in summer. [6] 13 hours in winter, 8 hours in summer. [7] ½ hour after sunset to ½ hour before sunrise. [8] One half, all night; other half, to midnight. [9] Mostly. [10] Opposite in business section; alternate in residential. [11] ½ hour before sunset to ½ hour after sunrise. [12] At street intersections.



G-E Novalux Composite traffic-control box—intersection type


×-Interconnected Flexible Progressive System in Main District.
●-Limited (Noninterconnected) Progressive System on Main Arteries.
○-Isolated Control at Important Intersections.

Typical complete installation of composite traffic-control system

Plan for the Future with the NEW G-E *COMPOSITE* TRAFFIC TIMER

THE new G-E Novalux composite timer—designed to supersede all other types—is universally applicable to future conditions of growth or change.

It is especially fitted to planned extension, as it can be installed at any intersection—at any time—without any cable interconnection between intersections.

In outlying areas, not yet fully developed, the timers can be set for independent control of each signal, according to individual needs. For areas where it is not yet advisable to lay cables, such as avenues leading into downtown districts, the timer can be kept in step with the heavy-traffic centers—without cable intercommunication.

JOIN US IN THE GENERAL ELECTRIC PROGRAM, BROADCAST EVERY SATURDAY EVENING ON A NATION-WIDE N.B.C. NETWORK

At the Flick of a Switch

In heavy-traffic areas, the *triple reset feature* permits change of signal operation that—with predetermined speed—will clear morning one-way rushes, normal two-directional traffic, and peak flow of the late afternoon. And new installations can be built up one intersection at a time, if desired. Adjustments can be made automatically or manually—*at the flick of a switch*—from the central control panel or from a selected remote point.

The nearest G-E specialist has a model demonstration set which he will be glad to bring to your office. Phone him or write for an appointment.

720-167

GENERAL ELECTRIC

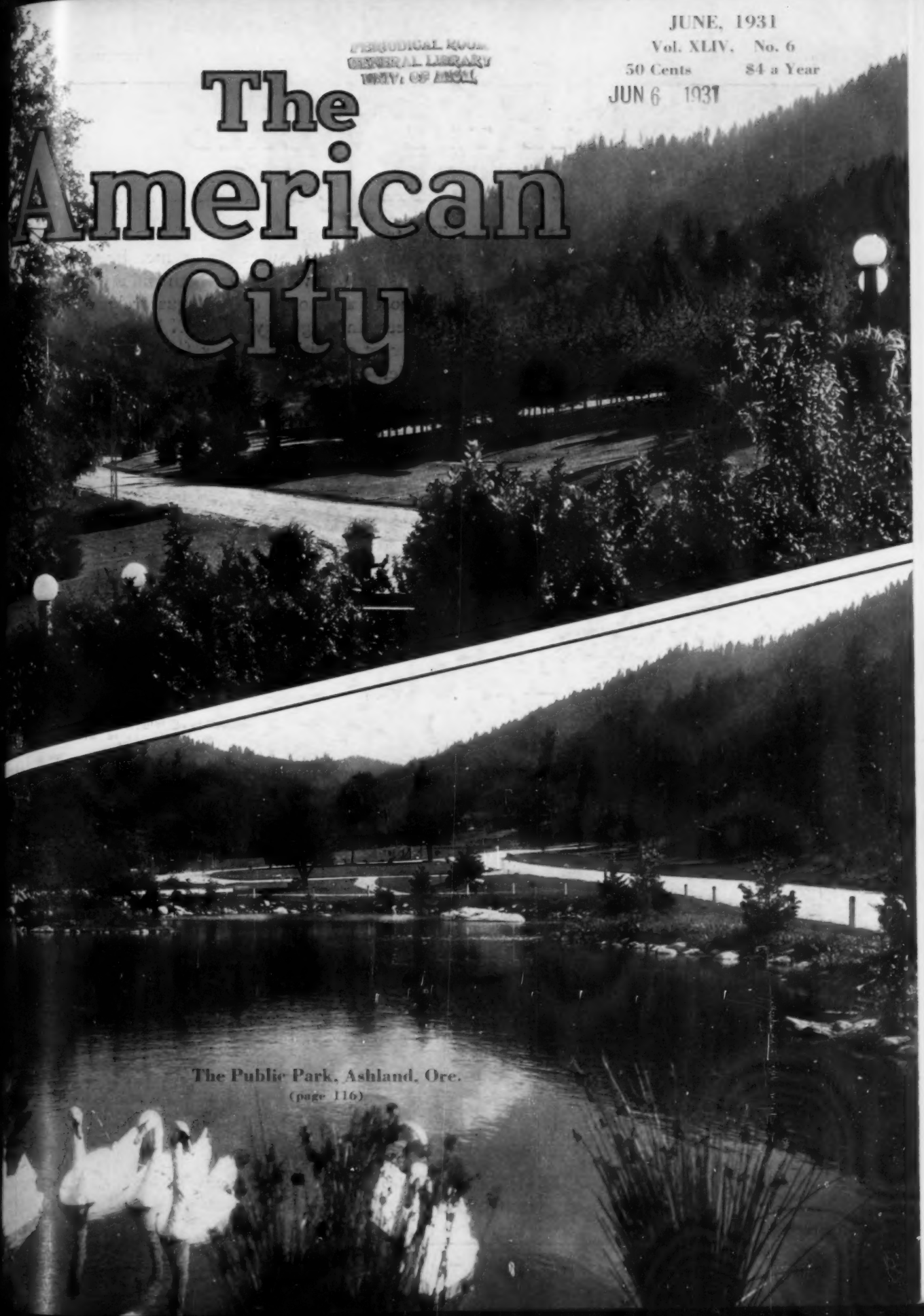
SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

PERIODICAL ROOM
GENERAL LIBRARY
UNIV. OF MICH.

JUNE, 1931
Vol. XLIV, No. 6
50 Cents $4 a Year

JUN 6 1931

The American City



The Public Park, Ashland, Ore.
(page 116)